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Bibliography on Mountain Meteorology, p. 916

Vol. 2 November, 1951 No. 11

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 2 NOVEMBER 1951 No. 11

AGRICULTURE · COMMERCE · AERIAL
AND MARINE NAVIGATION · PUBLIC HEALTH · INDUSTRY · ENGINEERING
AMERICAN METEOROLOGICAL SOCIETY
1919

SPECIAL FEATURE IN THIS ISSUE

A Selective Annotated Bibliography on Mountain Meteorology

(For complete table of contents see back cover)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains from 100 to 200 abstracts of current periodical literature and monographs in the fields of meteorology, hydrology, oceanography, etc. These abstracts are arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of from 50 to 250 important references on a special subject without respect to recency of material. No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject. Preference is given to recent material, comprehensive works, material from obscure sources, and items with good bibliographies.

Vol. 1, No. 1–11, Jan.–Nov. 1950 carried the following bibliographies: *Atmospheric Pollution, Aerobiology, Cloud Physics and "Rainmaking," Hail, Tornadoes, Volcanic Dust, Climatic Changes, Thunderstorms, Icing, Acoustical Propagation* and *Evaporation.*

Bibliographies published this year were:

1. **Extended Forecasting,** Vol. 2, No. 1, Jan. 1951.
2. **Long Range Forecasting,** Vol. 2, No. 2, Feb. 1951.
3. **Soil Temperature,** Vol. 2, No. 3, March 1951.
4. **Constants, Units, Tables and Diagrams,** Vol. 2, No. 4, April 1951.
5. **Climate of the Near East,** Vol. 2, No. 5, May 1951.
6. **Climate of the Middle East,** Vol. 2, No. 6, June 1951.
7. **Special Winds,** Vol. 2, No. 7, July 1951.
8. **Radar Storm Detection,** Vol. 2, No. 8, Aug. 1951.
9. **Condensation Trails,** Vol. 2, No. 9, Sept. 1951.
10. **Climate of Northeast Africa,** Vol. 2, No. 10, Oct. 1951.
11. **Mountain Meteorology,** Vol. 2, No. 11, Nov. 1951.

Forthcoming bibliographies will be:

*12. None. (Entire issue will be **Cumulative Indexes.**)

Other bibliographies in preparation are:

Actinometers
Carbon Dioxide in the Atmosphere
Climate and Cancer
Climate of Central Africa
Climate of Northwest Africa
Climate of Southeast Asia
Climate of the East Indies
Climatology of South America
Dew
Frost and Frost Forecasting
Machine Methods in Meteorology
Microwave Transmission
Objective Forecasting
Oceanographic Meteorology
Ozone
Stratus Forecasting
Turbulence
Urban Climatology

Part III contains a listing of the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the June and December issues cumulative indexes are published.

**Note:* Because of the large number of entries in the annual index, and the inevitable delay in attempting to insure accuracy, this issue will not be ready for distribution for several weeks after the January 1952 issue is published.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used in this issue may be found in the following list:

DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DPU:	Columbus Memorial Library, Pan American Union, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory (and American Meteorological Society) Library, Milton, Mass.
NN:	New York Public Library, New York, N. Y.
PPAN:	Academy of Natural Sciences Library, Philadelphia, Pa.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts.

Geographic locations are in the English form rather than the form used locally, for example, Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5–6):146–151, May–June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol. 2), *Heft* 5–6 (No. 5 and 6), *pages* 146–151, May–June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

GENERAL METEOROLOGY

2.11–1 551.5

Newton, Harriet R., **The meteorologist and civil defense.** *Weatherwise*, 4(2):31–33, April **1951.** 3 figs. **MH-BH**—Meteorology can be used 1) to calculate the fall-out of radioactive particles and to evaluate the hazard to other locations on the basis of synoptic conditions, distribution of winds with height and the initial particle size distribution, 2) to predict the path of any lethal cloud in the lower atmosphere after a surface explosion and 3) to disseminate weather data to monitoring crews, rescue workers and fire fighters. *Subject Headings:* **Meteorology, Civilian defense.**—*I.L.D.*

2.11–2 551.5:06

Dunn, Gordon E., **The public weather service program at Chicago.** *Royal Meteorological Society, Canadian Branch,* [*Publications*], 2(2), Feb. **1951.** 9 leaves. fig. Mimeographed. **DWB**—The author, in charge of the U. S. Weather Bureau Forecast Center at Chicago, describes the work of the Bureau there. Following topics are covered: the recorded weather forecast provided in cooperation with the telephone company; the service rendered to business, industry and agricultural interests with that to electrical utilities emphasized; radio weather broadcasts; the verification system and the forecast improvement project carried out in conjunction with the Institute of Meteorology, University of Chicago. Points out the role of the private meteorologist in the United States, especially in the preparation of television weather broadcasts. *Subject Headings:* **Meteorological services, U. S. Weather Bureau, Chicago.**—*M.L.R.*

2.11–3 551.5:06

*Rae, R. W., **Joint Arctic Weather Project.** *Arctic*, 4(1):18–26, May **1951.** 4 figs., 2 tables. **MH-BH**—The three greatest advances in the Canadian Weather Service occurred 1) in the 1880's due to telegraphic reporting, 2) in the 1920's when radio reporting began and 3) in the 1947–50 period when the Arctic stations were established by joint Canadian and United States effort. The 5 stations (Eureka, Resolute, Isachsen, Mould Bay and Alert) and the history of their establishment (especially the last named), special problems encountered in the Arctic, the scientific program which in addition to routine surface and upper air observations includes measurement of the lapse rate in the first 75 ft. above the ground and in permafrost or soil, and snow and ice investigations are described. Brief climatic notes, which include mean temperatures, rainfall, snowfall and temperature extremes for the first four stations, are given. *Subject Headings:* **Arctic weather stations, Meteorological services, Progress in meteorology, Canadian Arctic, Canada.**—*M.R.*

2.11–4 551.5:06:93

El servicio Meteorológico Nacional de España. Antecedentes y organización. [National Meteorological Service of Spain. History and organization.] *Spain, Servicio Meteorológico Nacional, Publicación, Ser. C, Instrucciones,* No. 19, **1946.** 31 p. tables, fold. maps. **DWB**—A brief history of the Meteorological Service of Spain which had its origin in a commission formed in 1856 and realized in 1865. The present Instituto Central Meteorológico was founded in 1887. The growth of the network of stations from 23 in 1863 to about 2000 in 1945 is outlined. Pilot balloon observations and other aerological work were begun in 1913. Aviation meteorology, forecasting, climatology, library and regional centers (14) are discussed and the details of the various networks (synoptic, aviation, climatological, pluviometric and phenological) described and illustrated on large folded charts. *Subject Headings:* **Meteorological services, Networks, History of meteorology, Spain.**—*M.R.*

2.11–5 551.5:06(09)(82)

78° aniversario de Servicio Meteorológico Nacional. [Seventy-eighth anniversary of the National Meteorological Service.] *Meteoros*, Buenos Aires, 1(1):110–114, Jan. 1951. **DWB**—An address given on the occasion of the seventy-eighth anniversary of the National Meteorological Service of Argentina. Its Director traces briefly the history of the Meteorological Service, making reference to the earliest continuous series of observations made in Buenos Aires (1856–1875), the creation of the National Meteorological Office (1872) which was renamed and reorganized in 1945 as the National Meteorological Service, the first published daily weather maps (1902), the first pilot balloon observations (1927) and describes the present structure of the Meteorological Service. *Subject Headings:* **Meteorological services, History of meteorology, Argentina.**—*R.S.Q.*

2.11–6 551.5:539

Holzman, Ben, **The effect of atomic bomb explosions on weather.** *Weatherwise*, 4(1):3–4, 9, Feb. 1951. fig. **MH-BH**—The physical reasons as to why an atomic explosion cannot produce directly thunderstorms, rain or hurricanes are presented. It can affect weather indirectly by causing fires which may sustain convection for a long time or when exploded in shallow water by giving rise to base surge which may become a stratocumulus cloud from which rain falls. *Subject Headings:* **Atom bombs, Weather.**—*I.L.D.*

2.11–7 551.5:63

Berg, Hellmut, **Bericht über die agrarmeteorologische Tagung in Stuttgart-Hohenheim 14.–15. April 1951.** [Report on the agro-meteorological meeting in Stuttgart-Hohenheim, April 14–15, 1951.] *Geofisica Pura e Applicata*, 19(3–4):227–230, 1951. **MH-BH**—A substantial report of the meeting held at Stuttgart under the auspices of PROF. WEICKMANN (Deutscher Wetterdienst in der US-Zone) and DR. RENTSCHLER (Institute for Meteorology and Physics of the Agricultural College at Hohenbeim). Specific problems discussed were soil moisture, microclimate, wind protection and frost protection. Among those who read or discussed papers were RUDOLF GEIGER, W. HAUDE, N. WEGER, P. THRAN, K. KNOCH and H. FLOHN. *Subject Headings:* **Agricultural meteorology, Conventions, Stuttgart, Germany.**—*M.R.*

2.11–8 551.5(04)

Hornstein, R. A., **It's in the wind.** Canada, Meteorological Division, Dept. of Transport, [n.d.] 49 p. 3 figs., refs. **DWB**—A pocket size pamphlet in which are reproduced (with attractive illustrations) a series of popular radio broadcasts made by the author for the networks of the Canadian Maritime Provinces and Newfoundland. The subjects of these talks are: Hurricanes, Tornadoes, Waterspouts, Almanacs, Rainbows, Local variations in temperature, Sunspots and the weather, Rain and Lightning. These articles contain a surprising amount of up-to-date factual information on each of these subjects. *Subject Headings:* **Popular meteorology, Radio broadcasts.**—*M.R.*

2.11–9 551.5:001(04)

§Splaine, Richard E., **The weather; how and why.** Compiled from the *New York Times*, [n.d.] 32 p. 3 figs., photos, glossary p. 23–32. **DWB**—This pamphlet was compiled from daily weather reports. Describes briefly the instruments used in forecasting, and how to read the weather map. Includes cloud classifications and 10 excellent cloud photographs. There is a 10 page glossary of meteorological terms. *Subject Headings:* **Meteorology, Cloud photographs, Cloud classification, Weather forecasting, Definitions.**—*W.S.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METEOROLOGICAL STATIONS

2.11–10 551.501(98)(47)

Drogaĭtsev, D. A., **Desiat' let sluzhby pogody v Arktike.** [Ten years of weather service in the Arctic.] *Problemy Arktiki*, No. 2:115–119, 1944. **DGS**—Description of the work of

the meteorological station on the Isle of Dixon from 1934 to 1944. *Subject Headings:* **Meteorological stations, Soviet Arctic.**—*C.K.*

2.11–11 551.501.1:001

Instrucciones para los observadores de las estaciones pluviométricas. [Instructions for observers of rainfall stations.] *Spain, Servicio Meteorológico Nacional, Publicación, Ser. C, Instrucciones,* No. 17, **1946.** 25 p. diagrs. **DWB**—Details of installation, measurement and recording of observations of precipitation, cloudiness, hydrometeors and wind at pluviometric stations in Spain, of which there are about 1500 (1945). About 40 terms used in recording rainfall and hydrometeors and the international symbols thereof are defined. *Subject Headings:* **Instruction for observers, Rainfall networks, Definitions, Manuals, Spain.**—*M.R.*

2.11–12 551.501.42:551.571

Robitzsch, Max, **Eine einfache Auflösungsmethode für die Psychrometerformel.** [A simple method of solving the psychrometer formula.] *Zeitschrift für Meteorologie,* 5(5–6):143–147, May–June **1951.** 2 tables, equations. **MH-BH**—Proposes that aspirated thermometers should be graduated in equivalent temperatures θ as well as dry bulb T and wet bulb T' (or conversion tables used). Then v.p. $=\frac{1}{2}(\theta - T)$ for water or 0.44 $(\theta - T)$ for ice. Tables give θ for T 40 to −41°C. (water), 0 to −30°C. ice, at 755 mm. Relative and specific humidity are rapidly calculated. Corrections are given for other pressures. *Subject Headings:* **Conversion tables, Humidity measurement.**—*C.E.P.B.*

2.11–13 551.501.45:551.525.2

Horney, Günther, **Vorschläge für die Durchführung von Messungen des Wärme- und Wasserhaushaltes von Kulturpflanzenbeständen.** [Proposals for carrying out measurements of the heat and water economy of crop stands.] *Meteorologische Rundschau,* 4(5–6):100–103, May–June **1951.** 3 tables. **MH-BH**—Author puts $S = B + L + V + K$ where S is change of heat at surface, B heat flow from subsoil, L loss to air, V heat of evaporation and K the heat stored up by the plant covering. He also writes $L/V = 0.492\Delta\theta/\Delta e$ (gradients of potential temperature and vapor pressure). The instrumental determination of the various quantities is discussed. Tables are given for $(L/V)+1$ for various values of $\Delta\theta$ and Δe; for ΔB in different sub-layers (including snow and water) for different values of temperature gradient in upper 10 cm., and for K (cal./cm.²/min.) in terms of plant mass in g./cm.² and temperature change °C./30 min. *Subject Headings:* **Statistical methods, Surface temperatures, Heat and moisture balance, Agricultural meteorology.**—*C.E.P.B.*

2.11–14 551.501.7:06

Beelitz, Paul, **Die Entwicklung des Radiosonden-Dienstes im Bereich der Deutschen Demokratischen Republik seit 1946.** [The development of the radiosonde service in the domain of the "German Democratic Republic" since 1946.] *Zeitschrift für Meteorologie,* 5(7–8):247–248, July–Aug. **1951.** fig., table. **MH-BH**—Describes history and organization of radiosonde observations. Stations at Dresden, Lindenberg and Wernigerode began operations in 1947, Greifswald in 1949. *Subject Headings:* **Radiosonde networks, Meteorological services, East Germany.**—*C.E.P.B.*

2.11–15 551.501.9

König, W., **Die Brockenwetterwarte.** [The Brocken Observatory.] *Zeitschrift für Meteorologie,* 5(7–8):249–250, July–Aug. **1951.** fig. **MH-BH**—Gives a history of observations since 1893 on this 1142 m. high summit. A new observatory built in 1938 was partly destroyed in March 1945. Observations recommenced Sept. 1947, but rebuilding was not complete until autumn 1950. *Subject Headings:* **Brocken Observatory, Harz Mountains, Germany.**—*C.E.P.B.*

2.11–16 551.501.9:523

[The establishment of a Solar Observatory at Sacramento Peak, New Mexico.] *Harvard University, Report of Progress* No. 10, **1951.** 23 p. Mimeographed. (U. S. Air Force, Cambridge Research Center, Contract W19-122ac-17.) **DWB**—Details of personnel, procure-

ment and problems connected with the establishment of this observatory. Some information on studies of optical characteristics of filters and other specific projects is also given. Work of MENZEL on Transfer of Radiation III in connection with Eclipsing Binaries and on plasms oscillation, indicating the power of the magnetic field to support columns of ionized matter and on the mechanics of thunder, is of interest to those working with upper atmosphere physics. *Subject Headings:* **Astrophysical observatories, Sacramento Peak, New Mexico.**—*M.R.*

2.11–17 551.501.9

Rae, R. W., **Arctic experiences or life begins at forty below.** *Royal Meteorological Society, Canadian Branch, [Publications]*, 1(2), Feb. **1950.** 12 p. Mimeographed. **DWB**—Account of personal and personnel problems, as well as the general type of weather, encountered at the weather station at Resolute Bay in the Canadian Arctic. Since the chief function of this type of station is to secure basic data from a region previously unknown, the author believes the results obtained justify the cost. *Subject Headings:* **Meteorological stations, Canadian Arctic.**—*M.L.R.*

2.11–18 551.501.9(02)

§Spilhaus, Athelstan F., **Weathercraft: how to make and operate your own weather station.** New York, Viking Press, [**1951**]. Price $2.00. 64 p. figs., tables. **DWB**—The rudiments of observation of rain, snow, wind, temperature, humidity, clouds and pressure, and of constructing a simple observatory or weather station are told in a simple but scientific way for the benefit of amateurs of Junior High School age. The author, a competent meteorologist, is attempting to arouse enthusiasm among youngsters who may eventually go in for professional work in meteorology or forecasting. Simple nomograms, conversion tables, reporting forms and synoptic weather maps are included as well as photographs of home-made instruments and equipment. *Subject Headings:* **Popular meteorology, Instruments, Amateur observation, Textbooks, Manuals.**—*M.R.*

2.11–19 551.501.9:551.579.5

U. S. Weather Bureau, **Installation and operation of a soil-moisture station.** Provisional. Washington, D. C., **1949.** 17 p. 10 figs. **DWB**—A preliminary guide for making installations of the Bouyoucos block and bridge type of soil moisture equipment at Weather Bureau stations. The various elements (moisture blocks, bridges, thermisters, circuits, etc.) are described and illustrated. Selection of site, installation of equipment, calibration of elements and the making and recording of observations are taken up in order. Nomograms and sample recording forms are also included. *Subject Headings:* **Soil moisture measurement, Observers manuals.**—*M.R.*

OBSERVATIONS

2.11–20 551.506.1(058)(436) 550.3

*Austria. Zentralanstalt für Meteorologie und Geodynamik, **Jahrbuch 1949.** [Yearbook 1949.] Neue Folge, Band 86, Vienna **1950.** 127 p. figs., chiefly tables. (Publikation No. 161). **DWB**—Besides the actual and summarized daily observations at Vienna and Sonnblick and monthly data for all stations of first and second order, there is included an evaluation of automatic records of wind, earth temperature, illumination, sunshine, air temperature and precipitation, as well as phenological observations, thunderstorms, wind frequencies, magnetic and microseismic data. A report on the activity of the Zentralanstalt for 1949, a list of scientific publications by members of the staff, history of the development of the network and five scientific papers are also included. *Subject Headings:* **Observational data, Yearbooks, Geophysics, Austria.**—*M.R.*

2.11–21 551.506.1:551.582

*U. S. Weather Bureau, **Monthly climatic data for world.** Vol. 1–2+. **1948–1950+.** **DWB**—Each issue of this bulletin, which appears about a month after the data (for the previous month) are broadcast, contains the surface "Climat" data [pressure, temperature (and departures), precipitation total and quantities in 30 year distribution and coordination] arranged by continents and adjacent ocean areas, and by countries within each continent. In addition,

the upper air temperatures, dew points, and height of the 850, 700, 500, 300 and 200 mb. surfaces are given for each radiosonde station in the world which is listed in any of the regional disseminations. A brief summary, by continents, of surface temperature and precipitation anomalies or conditions helps to integrate this mass of data. Delayed or late reports for previous months are also included, so that the user can have as complete a picture as possible of world weather anomalies for the past months or year, without waiting for verified data. *Subject Headings:* **Climatic data, "CLIMAT" broadcasts, Temperature anomalies, Precipitation anomalies, Upper air climatology, World climate.**—*M.R.*

2.11–22 551.506.1(058)(481)

***Norway, Meteorologiske Institutt, Norsk Meteorologisk Åbok, 1949.** [Norwegian meteorological yearbook.] Oslo, **1951.** Price Kr. 10.000. 141 p. tables. In English and Norwegian. **DWB**—Chart shows location of 206 stations operating in Norway and Arctic islands during 1949. Table gives exact data as to location, height of instruments and time of observations, names of observers, etc. Detailed observational data, in some cases bi-hourly and in others thrice-daily, are given for each element for 150 stations. Monthly and annual summaries, departures from the normal period (1901–30), sea surface temperatures (12 stations), actual observations for Arctic stations for 1948, and for Oslo, Bergen, Trondheim and Tromsö for 1949, and data from recording instruments at Oslo (Blindern) for 1949 (pressure, temperature, precipitation, wind, relative humidity) are included in this model yearbook. *Subject Headings:* **Observational data, Yearbooks, Norway.**—*M.R.*

2.11–23 551.506.1:551.578.46(481)

*Norway. Meteorologiske Institutt, **Nedbøriakttagelser i Norge.** [Precipitation observations in Norway.] Vol. 53. Oslo, Aschehoug, **1950.** fold, chart, tables. Price Kr. 5.00. **DWB**—Rainfall data for Norway has been published in yearbooks for the period 1895–date, but with some irregularities. Summarized data for 1895–1943 and "normal" data for 1901–30 were published in 1949. In this volume, the daily precipitation data for about 500 stations in Norway are tabulated for the year 1947. Snow depth in cm. is tabulated for each 5 day period during the months from Oct.–May, for about 50 stations. Monthly and annual summaries of precipitation and snow depth are given by districts for each station. Percentage of "normal" for each month and the year is also given for 55 stations and, finally, a large colored chart shows actual precipitation (mm.) at each station and percent of normal (1901–30) for year 1947. Variation was from $<50\%$ in SE to $>130\%$ in N. *Subject Headings:* **Precipitation data, Snow cover, *Normal* period (1901–1930) Norway.**—*M.R.*

2.11–24 551.506.1(438)

Obserwacje dobowe we Wrocławiu, 1949. [Daily observations in Wrocław, 1949.] *Wrocław, Uniwersytet, Zakład i Obserwatorium Meteorologii i Klimatologii, Prace,* No. 4, **1951.** 48 p. 3 figs., 17 tables. English summary p. 21–22. **DWB**—The results of normal daily observations of air temperature, relative humidity, vapor pressure, cloudiness, wind direction and velocity, duration of sunshine, visibility, precipitation for the year 1949 are given. A list of the apparatus with which measurements were made is presented. The meteorological data are synthesized to give a description of the climate of Wrocław. *Subject Headings:* **Observational data, Meteorological instruments, Climatology, Wrocław, Poland.**—*I.L.D.*

2.11–25 551.506.1(058)(469)

*Portugal. Instituto Geofisico do Infante D. Luis, **Anais, 1950.** Vol. 88. Lisbon, **1951.** tables. **DWB**—Data on location of station, pressure, temperature, humidity, solar radiation, soil temperature, wind, precipitation, evaporation, cloud amount and type, state of the soil and horizontal visibility, tabulated for each hourly or thrice daily observation, day, month and for the year. Hydrometeors, etc. also tabulated. In addition to global radiation data, the mean and maximum sun temperature, the minimum nocturnal radiation temperature, the soil surface and soil temperature at .05, 0.3, 0.7, 1.1 and 1.5 m. depth are tabulated. The observatory is near Lisbon. *Subject Headings:* **Observational data, Yearbooks, Lisbon, Portugal.**—*M.R.*

2.11–26 551.506.1(058)(68)

*South Africa. Weather Bureau, **Annual report for South West Africa, 1946–1950.** [Praetoria, n.d.] 4 v. tables, diagrs. In Afrikaans and English. **DWB**—Contains monthly means of dry bulb and wet bulb temperatures and of relative humidity at 0830 and 1500, mean monthly maxima and minima and absolute maxima and minima of dry bulb temperature, monthly precipitation and wind direction and velocity; mean hourly values of dry bulb temperature and relative humidity, mean hourly values of barometric pressure; a list of rainfall stations. *Subject Headings:* **Observational data, Yearbooks, South West Africa.**—*I.L.D.*

2.11–27 551.506.8(493)

Lardinois, Émile, **Observations phénologiques à Uccle (I.R.M.) pour l'année 1950.** [Phenological observations at Uccle (I.R.M.) in 1950.] *Ciel et Terre*, 67(5–6):101–104, May–June **1951.** 4 tables. **MH-BH**—Summary of weather conditions affecting plant growth during 1950, as well as dates of flowering of two score plants and trees. Tables show mean monthly temperature, sunshine, precipitation and relative humidity (departures from normal and normals for period 1901–30 for Uccle, Belgium). *Subject Headings:* **Phenology, Agricultural meteorology, Uccle, Belgium.**—*M.R.*

2.11–28 551.506.8(47)

Selishchenskaia, A. A., **Obzor fenologicheskikh nabliudenii vesny 1950 g. v g. Leningrade.** [A review of phenological observations made during the spring of 1950 at Leningrad.] *Vsesoiuznoe Geograficheskoe Obshchestvo, Izvestiia*, 82(6):622–623, Nov.–Dec. **1950.** 5 figs. **DLC**—Data on march of temperature and precipitation, on blossoming of flowers, on appearance of insects and birds. *Subject Headings:* **Phenology, Leningrad, U.S.S.R.**

INSTRUMENTS

2.11–29 551.508:656.6

Hamburg. Deutsches Hydrographisches Institut, **Barometer- und Thermometer-Prüfvorschrift.** [Barometer and thermometer testing instructions.] Hamburg, **1948.** 36 p. 11 tables. **DLC**—Detailed instructions for calibration and correction of barometers and thermometers used on ships as well as conversion tables for use in both testing operations and in recording observations. Both aneroid barometers and barographs, and mercurial barometers of different types are considered. Calibration equipment is described and tables and nomograms for use in calibration included. Examples are also given. *Subject Headings:* **Calibration of instruments, Marine meteorological observation, Conversion tables.**—*M.R.*

2.11–30 551.508.21

Georgi, J., **Bemerkung zur Solarkonstanten.** [Remark on the solar constant.] *Zeitschrift für Meteorologie*, 5(5–6):136–139, May–June **1951.** 2 figs., table, 10 refs. **MH-BH**—K. Wegener (1949–50) argues that because of radiation from the instrument, measurements of incoming radiation by actinometer are 26–36% too low. Author finds that the theoretical error is only 2% of this. It is more or less compensated by unexcluded diffuse radiation and the net error is very small. *Subject Headings:* **Actinometers, Instrumental errors.**—*C.E.P.B.*

2.11–31 551.508.25:537.742.5

Falckenberg, G., **Röhrenvoltmeter für infrarote Strahlungsmessungen.** [Tube voltmeter for infrared radiation measurements.] *Zeitschrift für Meteorologie*, 5(7–8):245–246, July–Aug. **1951.** fig. **MH-BH**—A new high-frequency voltmeter is described, with wiring diagram. It is intended for rough usage (e.g., in aircraft) and has an accuracy of ½%. *Subject Heading:* **Voltmeters.**—*C.E.P.B.*

2.11–32 551.508.26:551.508.822

Nagel, F., **Ein neuartiges Thermometer für Radiosonden.** [A new type of thermometer for radiosondes.] *Meteorologische Rundschau*, 4(5–6):105–107, May–June **1951.** 4 figs. **MH-BH**—A thermometer is described which utilizes the contraction of a silvered duralumin wire 0.2 mm. diameter. Lag is very small; there is no radiation error and no hysteresis effect. *Subject Headings:* **Thermometers, Radiosondes.**—*C.E.P.B.*

2.11–33 551.508.27:551.525

Arzt, Theodor, **Messungen der Extremtemperaturen in kleinen Hütten und ihre Fehler.** [Measurements of extreme temperatures in small screens and their errors.] *Meteorologische Rundschau*, 4(5–6):103–105, May–June **1951. MH-BH**—Observations of maximum and minimum temperature were made at Giessen in screens 50×25×25 cm. at 25, 50, 100 and 200 cm. height, also grass minimum and in normal screen at 2 m. The mean errors in the small screen at 200 cm. were: maximum ±0.23, minimum 0.42°C. Effects of wind speed and cloudiness are considered. The errors of all 4 small screens were also determined directly with an aspirated thermometer; all were about 0.33°C. *Subject Headings:* **Instrument shelters, Instrumental errors, Surface temperatures.**—*C.E.P.B.*

2.11–34 551.508.53(02)

Popov, Sergeĭ Grigor'evich, **Izmerenie vozdushnykh potokov.** [Measurement of air currents.] Moscow, OGIZ, **1947.** 297 p. 118 figs., refs., equations. **DLC**—This textbook takes up many different methods of measuring air currents, with ample references to native and foreign literature in this field. First, the different types of hydrostatic manometers are discussed, the theory developed and calibration and use of the apparatus fully treated. Second, the measurement of flow by means of pressure, starting with the Bernoulli-Euler equations and going into detail in the special case of PITOT, PRANDTL and VENTURI tubes, pressure anemometers, hot wire anemometers and their use and calibration, applications to turbulence and wind tunnel investigation are mentioned. The third chapter goes more fully into hot wire anemometry and turbulence measurements, and the final chapter into visual methods. *Subject Headings:* **Anemometry, Turbulence measurement, Textbooks.**—*M.R.*

2.11–35 551.508.71

Hyde, W. Lewis, **An automatic frost point hygrometer.** *U. S. Office of Naval Research, London, Technical Report* No. ONRL-30-51, April 3, **1951.** 3 p. **DWB**—A description of an automatic frost point hygrometer, developed by BREWER and DOBSON, for measuring relative humidity at high altitudes. The frost is observed on a black anodized aluminum disc, cooled with liquid air; its presence is indicated by the scattered light received by a photomultiplier. The temperature of the surface is controlled by balancing cooling and heating. The instrument operates at frost points as low as −78°C.; its time of response is about 15 seconds; its accuracy is ±1°C. *Subject Headings:* **Hygrometers, Frost point measurement.**—*I.L.D.*

2.11–36 551.508.79:551.577

Maulard, J., **Mesure du nombre de gouttes de pluie.** [Measurement of the number of raindrops.] *Journal Scientifique de la Météorologie*, 3(10):69–73, April–June **1951.** 6 figs. French, English and Spanish summaries p. 69. **MH-BH**—A distant recording device has been constructed which will measure the number of snowflakes or raindrops falling per minute (or second) over a given area, without the presence of an observer. A telephone receiver is modified to reduce effects of sound waves and to allow the water to run off. Each drop which strikes the membrane creates an impulse which is amplified and sent to a recorder. Wiring and schematic diagrams and examples of records are presented. Difference between records for a rainstorm, a snowstorm and a thundershower is shown vividly. *Subject Headings:* **Raindrop frequencies, Distant recording equipment.**—*M.R.*

2.11–37 551.508.822

Isono, K. and Huziwara, Y., **Improved code sending type radiosonde.** *Papers in Meteorology and Geophysics*, Tokyo, 1(2–4):299–312, Dec. **1950.** 11 figs., 14 refs. **DWB**—The construction of the radiosonde used in Japan since Feb. 1949 is summarized. Accuracy of measurements is discussed; comparison with United States type shows no systematic differences. Some improvements are described. *Subject Heading:* **Japanese radiosondes.**—*C.E.P.B.*

2.11–38 551.508.822

Malet, L., **Précision des sondages aérologiques.** [Accuracy of aerological soundings.] *Belgium, Institut Royal Météorologique, Mémoires*, Vol. 46, **1951.** 23 p. 3 tables, 5 equations.

DWB—A systematic presentation in tabular and graphic form of the results of the comparison trials made with radiosondes of six types at Payerne, Switzerland from May 10 to 27, 1950. In this study only the accuracy of the pressure elements, as evidenced by variations in the calculated height of the constant pressure surfaces (850, 700, 500, 300, 200 and 100 mb. day and night), and the variations in ascension rate are considered. The heights of the various surfaces are plotted on large charts for each day, and for the 850 and 500 mb. surfaces compared with heights obtained from charts plotted at Bad Kissingen, Hamburg and Uccle. It is apparent that the pressure readings obtained by radiosondes are not as accurate as generally supposed. *Subject Headings:* **Radiosonde errors, Upper air soundings, Radiosonde comparisons, Pressure measurements, Payerne, Switzerland.**—*M.R.*

SYNOPTIC ANALYSIS AND FORECASTING

2.11–39 551.509.3:551.513

†§Riehl, Herbert; Badner, J.; Hovde, J. E. and others, **Forecasting in middle latitudes.** Chicago, University, Dept. of Meteorology, March **1951.** 168 p. 65 figs., 3 tables, 77 refs., equations. **DWB, MH-BH**—A manual prepared for a course in forecasting given during 1950 at the U. S. Weather Bureau Forecast Center in Chicago. Actual rules for construction of surface and upper air prognostic charts, with sufficient theory and many empirical rules or suggestions, make this one of the few such works to appear in the last 40 years. Separate chapters deal with formation and deepening of cyclones, movements of cyclones, movements of anticyclones and fronts, and rules for forecasting temperature and precipitation in the Chicago Forecast District. Three actual series are analyzed and discussed, prognostic charts drawn and a "post mortem" given. Nomograms and tables are given in appendix. *Subject Headings:* **Synoptic forecasting, Textbooks, Chicago Forecast District.**—*M.R.*

2.11–40 551.509.3:551.515.4(788)

Tillotson, Kenneth C., **An objective aid for forecasting September thunderstorms at Denver, Colo.** *Monthly Weather Review*, 79(2):27–34, Feb. **1951.** 6 figs., 12 tables, 6 refs. **DWB**—A general discussion of thunderstorms in the Denver area is followed by a statistical analysis of the occurrence (diurnal and monthly) and persistence of thunderstorms in that region, the mechanism of thunderstorm formation, effect of orography, etc. The variables analyzed in constructing an objective formula were: winds in the free air, 700 mb. flow, mixing ration, pressure lapse between condensation and freezing level and moist instability. The three most successful variables were combined and results tested with 85% of 60 correct, compared to 75% correct for official forecasts. *Subject Headings:* **Objective forecasting, Thunderstorm forecasting, Denver, Colorado.**—*M.R.*

2.11–41 551.509.312

Gentry, Robert C., **Notes on interdiurnal pressure and temperature changes in the upper air.** *U. S. Weather Bureau, Research Paper* No. 12, May **1946.** 17 p. 4 figs., 6 refs., 7 equations. **DWB**—An attempt was made to find significant relationships which might help in objective forecasting. Some of these studies of empirical relationships were: 1) relation between pressure at different constant level, 2) relation of temperature changes at 13 km. to advection, 3) potential temperature at 13 km. with temperature changes or pressure changes at other levels, 4) compensation between stratosphere and troposphere, and 5) relationship between changes of pressure and temperature at 3 km. Conclusions are given in statistical terms—for instance: there proved to be a high negative correlation between changes in potential temperature at 13 km. and changes in pressure at 10 km. *Subject Headings:* **Differential kinematics, Objective forecasting, Interdiurnal pressure changes, Compensation, Pressure-temperature correlations.**—*M.R.*

2.11–42 551.509.317:551.547.1:629.13

Sobolev, L. G., **"Uslovnaia vysota" v aerologicheskikh telegrammakh.** ["Equivalent altitude" in aerological telegrams.] *Meteorologiia i Gidrologiia*, No. 3:70–73, **1947.** 3 tables, 14 equations. **DWB**—The paper contains an account of the report Dr. Petterssen presented

at the meeting of the Commission on Aviation-Meteorology in Paris in June 1946 about a uniform unit for altitude measurement in aviation and meteorology. Examples for corrections are given in tables. *Subject Headings:* **Computation tables, Equivalent height, Aeronautical meteorology.**—*C.K.*

2.11–43 551.509.33

†Aubert, Eugene J., **The application of one-dimensional numerical methods to extended forecasting.** U. S. Weather Bureau, Extended Forecast Section, April **1951.** 27+p. 9 figs., 2 tables, 13 refs., 15 equations. **DWB**—An attempt is made to determine whether numerical forecasts using the one-dimensional barotropic model of CHARNEY and ELIASSEN could be used to prepare prognostic charts for up to four days in advance. Forecasts were made for North America and the Atlantic for twelve five-day mean winter cases for the 700 mb. level and were compared with routine 5-day mean forecasts and were found to be just as good. Techniques are outlined, formulas derived and illustrative charts included. *Subject Headings:* **Mathematical forecasting, Extended forecasting.**—*M.R.*

2.11–44 551.509.33

Baur, Franz, **Vorschau auf die Sommerwitterung.** [Preview of the summer weather.] *Naturwissenschaftliche Rundschau,* 4(6):261, June **1951.** **DWB**—Forecast of summer 1951 in Germany. Basis to be given later. (*See* 2.11–45 below.) *Subject Headings:* **Long range forecasting, Germany.**—*C.E.P.B.*

2.11–45 551.509.33

Baur, Franz, **Witterungsaussichten für den Sommer 1951.** [Weather prospects for summer 1951.] *Naturwissenschaftliche Rundschau,* 4(7):286–289, July **1951.** 4 tables, 4 refs. **DWB**—Author lists the characteristics of Jan.–April 1951 in Europe and picks out 12 similar years, for each of which he notes rainfall and temperature departures in the following summer. Wet and cool weather is suggested but the possibility that this is a chance result is not excluded. From this, position in sunspot cycle and other (unstated) considerations, he forecasts an intermediate changeable summer in Germany, wet July 21–Aug. 1. *Subject Headings:* **Long range forecasting, Germany.**—*C.E.P.B.*

2.11–46 551.509.33

§Clapp, Philip F., **Recent researches of direct application to extended forecasting.** U. S. Weather Bureau, Extended Forecast Section, May **1951.** 13+p. 10 figs. **DWB**—The three methods used by different schools of extended forecasting: 1) types or analogs, 2) objective or statistical methods and 3) the evolutionary method are discussed briefly. The last named method, which is used by the U. S. Weather Bureau Extended Forecast Section, is elaborated upon and illustrated with charts and diagrams. The three methods are said to be less distinct from each other than their proponents claim. The Northern Hemisphere Chart Series and statistical correlations are used by the U. S. Weather Bureau in the evolution of 5-day or monthly mean prognostic charts. Extrapolation, persistence and development of large scale circulation features constitute a large part in the techniques described. *Subject Headings:* **Extended forecasting, General circulation.**—*M.R.*

2.11–47 551.509.33

Dufour, L., **Sur quelques résultats obtenus dans le domaine de la prévision à longue échéance.** [Some results obtained in the field of long range forecasting.] *Belgium, Institut Royal Météorologique, Miscellanées,* Fasc. 39, **1950.** 28 p. 9 figs., 20 refs. **MH-BH**—The author discusses in a general way the scientific principles underlying long range forecasting as practiced in Germany, in the Soviet Union and especially in the United States. A discussion of the forecasting indexes, the preparation of forecasting maps and of the making of the forecast is presented and the long range forecasting results in the United States are evaluated. *Subject Headings:* **Long range forecasting, United States, Germany, U.S.S.R.**—*I.L.D.*

2.11–48 551.509.33:551.513

Klein, William W., **Statistical forecasts of the 700 mb zonal index.** U. S. Weather Bureau, Extended Forecast Section, May **1951.** 4+p. table, 2 refs. **DWB**—An attempt

to evaluate the effectiveness of the statistical relationships which have been used or proposed for forecasting the 5-day mean 700 mb. zonal index. Data for Oct. 15, 1948 to Nov. 2, 1949 (100 cases of 5-day mean periods) were used and a score of relations tested. The best results were obtained from use of the standard formula for computing the full week regression index: 1/10 the sum of 8× the normal index and 2× the last daily index. This gave a correlation coefficient of .74. *Subject Headings:* **Extended forecasting, Zonal index, Correlation coefficients.**—*M.R.*

2.11–49 551.509.33

Serra, Adalberto, **Método gráfico de pronóstico.** [Graphic method of forecasting.] *Nimbus*, 2(6–7):37–40, April–Sept. **1950.** fig. **MH-BH**—A simple graphic method for extrapolation of records of temperature, pressure, sunspot numbers, zonal indexes, etc. where the periodicity is irregular. The mean time interval is ignored and the "forecast" curve (or time of maxima and minima) obtained by projecting the actual (smoothed) variations into the future. This method is probably as good as any. *Subject Headings:* **Extended forecasting, Periodicities, Graphical presentation.**—*M.R.*

2.11–50 551.509.34:551.524

Hardy, Albert V., **Forecasting the weather—An objective method for forecasting minimum temperatures at New York City.** *Weatherwise*, 4(2):42–45, April **1951.** 2 figs., table. **MH-BH**—A description of the method developed by Woodrow W. Dickey for forecasting minimum temperature and its application to forecasting winter minimum temperatures at New York City. The method is based upon a network of sea-level pressure readings designed to provide an objective estimate of the source of air expected over the station at the time of the minimum. The forecasting equations and results are given. *Subject Headings:* **Objective forecasting, Temperature forecasting, New York City.**—*I.L.D.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

STRUCTURE OF THE ATMOSPHERE—IONOSPHERE

2.11–51 551.510.3

Mooley, D. A., **Normal density distribution in the atmosphere.** *Indian Journal of Meteorology and Geophysics*, 2(2):127–137, April **1951.** fig., 5 tables, 5 refs. **MH-BH**—This study of density distribution in the atmosphere aims at examining the validity of the statement of Napier Shaw that at the level of the eighth kilometer the density is normally constant throughout the year and uniform all over the world (except at Agra). Graphs showing normal density distribution in the atmosphere up to elevations of 17 km. in the northern winter and in the northern summer at various localities and tables giving normal density data for India and Pakistan and for selected stations over the entire world are presented. The density in the vicinity of the eighth kilometer varies slightly over the globe during the winter and varies slightly in summer north of latitude 40°N. In the tropics, the variation of density near the eighth kilometer varies considerably with latitude and with season. *Subject Headings:* **Atmospheric density, Agra, India.**—*I.L.D.*

2.11–52 551.510.41:546.296

Ungeheuer, H., **Die Beziehungen des bodennahen Ozons (Aran) zu den Wetterfaktoren.** [The relations of ozone near the ground (aran) to weather factors.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 5:53–58, **1951.** 7 figs., 8 refs. **MH-BH**—Autographic measurements of aran have been made at Bad Stolz since March 1949. They show a positive relation to temperature difference ground — 700 mb.; departures are related to surface wind speed and to humidity at 700 mb. Diurnal variation shows maximum afternoon (convection) and night (mountain wind), main minimum about 7h. (inversion). Increases of aran are also related to cold fronts. *Subject Headings:* **Aran, Atmospheric composition, Meteorological elements.**—*C.E.P.B.*

2.11–53 551.510.42:614.7

†Davidson, Ward F., **The dispersion and spreading of gases and dusts from chimneys.** *Industrial Hygiene Foundation of America, Inc., Conference on Industrial Wastes, Transactions Bulletin* No. 13:38–55, **1949.** 6 figs., 22 refs. **DWB**—This article is a summary of available data and information on the dispersion and diffusion of gases and fine dusts discharged into the atmosphere from chimneys. The author considers: 1) aerodynamic factors—the effects of exit gas velocity and buoyancy, the influence of buildings and terrain and describes an experimental study on the aerodynamic, exit velocities and stack height conditions that impel visible smoke downward and 2) meteorological factors—wind velocity and wind direction, temperature inversion and turbulent diffusion. *Subject Headings:* **Atmospheric pollution, Gases.**—*I.L.D.*

2.11–54 551.510.42

Hebley, Henry F., **Discussion of meteorological aspects of air pollution.** *Industrial Hygiene Foundation of America, Inc., Conference on Industrial Wastes, Transactions Bulletin* No. 13:57–69, **1949.** plate, 5 diagrs. **DWB**—The following topics are considered: the relationship of industrial pollution to ground fog, the influence of air movement, of lapse rate, of temperature, of the diurnal cycle of air movement and of atmospheric stability upon air pollution. Diagrams illustrating the effect of lapse rate, atmospheric stability and atmospheric circulation are given. *Subject Heading:* **Atmospheric pollution.**—*I.L.D.*

2.11–55 551.510.5

Graves, Maurice E., **The relation between the tropopause and convective activity in the subtropics (Puerto Rico).** *American Meteorological Society, Bulletin,* 32(2):54–60, Feb. **1951.** 13 figs., 6 refs. **MH-BH**—Contrary to prevalent belief, there is no relation between the high, cold tropopause of the subtropics and convective activity in the troposphere and, furthermore, the secondary tropopause rises prior to *cessation* of convective activity for 48 hours or more. These conclusions were reached after studying temperature lapse rate curves based on radiosonde data for San Juan, Puerto Rico, for 1942–1945 and comparing them with wind, pressure and rainfall index data for the same period. *Subject Headings:* **Tropopause, Convective activity, Rainfall index, Puerto Rico.**—*M.R.*

2.11–56 551.510.5:621.396.11

Linford, Leon B., **Physical properties of the upper atmosphere.** *Utah, University, Progress Report* No. 3, Nov. 24, **1950.** 22 p. 7 figs. (Contract AMC No. W19-122 ac 15.) **DWB**—Most of the report is concerned with the design of circuits and modifiers for wide-deviation reaction-tube modulator equipment for use in studying transmission constants of electro-magnetic waves in the optical, 10-cm., 500-Mc, 18-Mc and 4.5-Mc bands; and dispersion curves with band widths of 2-Mc centered at 18-Mc and 4.5-Mc. Previously the maximum deviation at 2-Mc was 7.5% swing. On this project swings as high as 71% were obtained. *Subject Heading:* **Microwave transmission.**—*M.R.*

2.11–57 551.510.53

Koteswaram, P., **Physical properties of the upper atmosphere over India.** *Indian Journal of Meteorology and Geophysics,* 2(2):101–112, April **1951.** 7 figs., 8 tables, 24 refs. **MH-BH**—On the basis of radiosonde data and sound propagation experiments, the author constructed a height temperature curve from the ground up to 100 km. for Central India. An isothermal layer is absent in the lower stratosphere over India; the temperature increases steadily above the tropopause. The monthly variations in temperature, pressure and density up to the levels of 20 km. are presented graphically and in tables. Data on monthly geostrophic wind velocities at heights up to 20 km. at latitudes 20° to 30°N. are given. At all levels, westerly winds prevail in winter and easterly winds in summer. *Subject Headings:* **Structure of the stratosphere, Radiosonde data, India.**—*I.L.D.*

2.11–58 551.510.535:550.385

Eyfrig, Rudolf, **Influence des orages magnétiques sur la region F2.** [Effect of magnetic storms upon the F2 region.] *Académie des Sciences, Paris, Comptes Rendus,* 232(23):2125–

2127, June 4, 1951. tables, 2 refs. **DWB**—A statistical study of ionospheric storms between 1948 and 1950 based upon data from stations in Europe and Africa reveals a dissymetry of ionizations during the northern summer. Magnetic storms bring about a diminution of ionization in the Northern Hemisphere and a simultaneous interrefraction in the Southern Hemisphere. *Subject Headings:* **Magnetic storms, F2 layer, Europe, Africa.**—*I.L.D.*

2.11–59 551.510.535

Gerson, N. C., **Sporadic E movements on 21 June 1949.** *Tellus*, 3(1):56–59, Feb. 1951. 6 figs. **MH-BH**—Data received from radio amateurs in the United States are plotted on hourly charts (2400Z June 20 to 0400Z June 21) to show westerly drift of sporadic E layer. Two centers appear, moving from the upper Ohio Valley to the Ozarks and from Missouri to Wyoming, respectively, although reports from the more western locations are quite scattered. *Subject Headings:* **Ionospheric drift, Sporadic E layer.**—*M.R.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

2.11–60 551.511

Gambo, D., **Dynamics of the motion of the parcel of air on a rotating earth.** *Tokyo University, Geophysical Institute, Geophysical Notes*, 3(28), 1950. 21 p. 2 figs., 2 tables, 8 refs., 95 equations. Also in *Collected Meteorological Papers*, Tokyo, 2(2), Dec. 1950. In English. **MH-BH**—Author attempts to simplify dynamical problem of air in motion conserving absolute angular momentum. He first sets out Hamiltonian equations of motion on spherical coordinates with origin at earth's center. Next he examines criteria of horizontal, vertical and general stability and gives a simplified proof of BJERKNES' circulation model. The equations of motion of a parcel of air on a horizontal surface are set out and its trajectory calculated. *Subject Heading:* **Dynamics of the atmosphere.**—*C.E.P.B.*

2.11–61 551.511:551.521

Möller, Fritz, **Der Wärmehaushalt der Atmosphäre.** [The heat economy of the atmosphere.] *Experientia*, Basel, 6(10):361–367, Oct. 1950. 4 figs. English summary p. 367. **MH-BH**—An interesting summary with new calculations. Of the solar radiation, 35% is reflected unchanged, 14% absorbed by atmosphere and 51% by earth's surface. But the atmosphere gives out 42%. The balance is maintained mainly by evaporation and condensation. Profiles of vertical distribution of gain and loss of heat are constructed for rainy middle latitudes, rainy tropics, deserts and northeast Siberia in winter. The upward transfer of heat occurs in regions of new cyclone development and over the warm ocean currents. *Subject Headings:* **Radiation, Heat and moisture balance.**—*C.E.P.B.*

2.11–62 551.511

Neis, B., **Wandlungen in der dynamischen Meteorologie.** [Changes in dynamical meteorology.] *Zeitschrift für Meteorologie*, 5(7–8):193–200, July–Aug. 1951. **MH-BH**—Traces the growth of dynamical meteorology from an application of classical hydrodynamics to an independent science. The part played by R. SÜRING, especially in the *Meteorologische Zeitschrift*, is emphasized. Sections include: the development of mathematical physics in the last 60 years, the influence of classical hydrodynamics and thermodynamics, the theory of flow, the circulation of the atmosphere and non-mechanical forms of energy (latent heat, radiation). Several outstanding monographs are analyzed. *Subject Headings:* **Progress in meteorology, Hydrodynamics.**—*C.E.P.B.*

2.11–63 551.511

Rossby, Carl-Gustav, **On the vertical and horizontal concentration of momentum in air and ocean currents. I. Introductory comments and basic principles, with particular reference to the vertical concentration of momentum in ocean currents.** *Tellus*, 3(1):15–27, Feb. 1951. 10 refs., 91 equations. **MH-BH**—An attempt to show theoretically the physical basis for the highly concentrated (horizontally and vertically) zones which are known as "jet streams" in the atmosphere and currents such as the Gulf Stream in the ocean. A critical velocity-density

relationship is deduced which might give rise to the concentration of momentum and the sharp boundaries of these streams. *Subject Headings:* **Jet stream, Ocean currents, Concentration of momentum.**—*M.R.*

2.11–64 551.511

Sasaki, Y., **On the trajectory of the inertia motion of a parcel of air.** *Tokyo University, Geophysical Institute, Geophysical Notes*, 3(32), **1950.** 16 p. 20 figs., table, 2 refs., 41 equations. Also in *Collected Meteorological Papers*, Tokyo, 2(2), Dec. **1950.** In English. **MH-BH**—Derives an exact solution of the motion of a particle of air along an equipotential surface, conserving energy and angular momentum. Three types of real motion can exist and are defined. A numerical example is worked out and shows some relatively small differences from WHIPPLE'S approximate result. *Subject Headings:* **Mechanics of the atmosphere, Air parcel trajectories.**—*C.E.P.B.*

2.11–65 551.511

Van Mieghem, Jacques, **Les bilans énergétiques en météorologie dynamique.** [The energy balance in dynamic meteorology.] *Geofisica Pura e Applicata*, 19(3–4):159–166, **1951.** 7 refs., 21 equations. In French, French and English summaries p. 159. **MH-BH**—In this paper, energy equations of balance are established in any type of frame moving with an arbitrary variable velocity with respect to space and time. The equation of balance of mechanical energy can be deduced from the equations of motion of air with respect to moving frame. The equation of balance showing the conservation of total energy will be obtained by transposing in the moving frame the expression of the first principle of thermodynamics given for the absolute frame. *Subject Headings:* **Dynamics of the atmosphere, Energy balance.**—*Author's abstract.*

2.11–66 551.511

Vialar, J., **Analyse du champ de divergence.** [Analysis of a field of divergence.] *Journal Scientifique de la Météorologie*, 3(10):37–56, April–June **1951.** 12 figs., 28 equations. French, English and Spanish summaries p. 37. **MH-BH**—The theory of gradient winds with respect to divergence is developed, followed by a detailed mathematical and graphical presentation of the effect of latitude, curvature, confluence and diffluence, temperature (solenoids) and a comparison of the magnitude of these various effects in part and combined, for the case of a depression and an anticyclone. Nomograms are given for calculating these various factors. *Subject Headings:* **Mechanics of the atmosphere, Divergence.**—*M.R.*

2.11–67 551.511:551.515

§Matsumoto, S., **A proposition on the advection problem.** *Papers in Meteorology and Geophysics*, Tokyo, 1(2–4):211–216, Dec. **1950.** 4 figs., 6 refs., 11 equations. **DWB**—By using $\partial\theta/\partial p$ as a conservative property, author develops expressions for thermal stability during advection. From observations at a single point horizontal divergence or convergence can be calculated as a function of θ; this is done for anticyclonic and cyclonic situations. *Subject Headings:* **Thermodynamics of the atmosphere, Advection.**—*C.E.P.B.*

2.11–68 551.511.45:518.2

Bushby, F. H., **Relaxation methods and their application to meteorological problems** *Meteorological Magazine, London*, 80(945):71–77, March **1951.** 5 figs., 8 equations, 4 refs **DLC**—Sets out briefly relaxation method of solving simultaneous equations by iteration, and differential equations by a relaxation net or cubic grid. Finding the instantaneous tendency of the 500-mb. surface is given as a meteorological example. *Subject Headings:* **Mechanics of the atmosphere, Mathematical techniques.**—*C.E.P.B.*

GENERAL CIRCULATION

2.11–69 551.513

Aubert, Eugene J. and Winston, Jay S., **A study of atmospheric heat-sources in the Northern Hemisphere for monthly periods.** *Journal of Meteorology*, 8(2):111–125, April **1951.**

15 figs., 17 refs., 7 equations. **MH-BH**—The energy changes associated with the general circulation are discussed theoretically and calculated from charts of anomalous heating or cooling in the layer from sea level to 10,000 ft., based on previous work by SVERDRUP, JACOBS, WEXLER and others. Charts of Northern Hemisphere show horizontal and vertical heating for various months in 1945 and normal horizontal heating in Jan., April, July and Oct. Departures from normal are shown for Jan. and July 1945. Marked changes occurring from month to month and year to year, exceed normal variation. *Subject Headings:* **General circulation, Energy exchange, Northern Hemisphere.**—*M.R.*

2.11–70 551.513.1:523.73

Biermann, L., **Bemerkungen über das Rotationsgesetz in irdischen und stellaren Instabilitätszonen.** [Remarks on the law of rotation in terrestrial and stellar zones of instability.] *Zeitschrift für Astrophysik*, 28(3):304–309, **1951.** 2 figs., equations. **MH-BH**—It is generally assumed that a zone of convection rotates like a rigid body. Author shows that in a zone of thermal instability the rotation law must lie between limits $\omega =$ constant and about $1/r^2$, and the motion be predominantly vertical. In the earth's atmosphere, turbulent friction plays a dominant part and motion is along inclined isentropic surfaces; the rotation moment is considerably smoothed. *Subject Headings:* **Dynamics of the atmosphere, Stellar atmospheres.**—*C.E.P.B.*

2.11–71 551.513.1

Charney, Jule G., **The dynamics of long waves in a baroclinic westerly current.** *Journal of Meteorology*, 4(5):135–162, Oct. **1947.** 13 figs., 3 tables, 18 refs., 116 equations. **MH-BH**—A model is constructed of the observed state of the atmosphere, which is then treated mathematically. The equations of motion and boundary conditions are formulated for a small perturbation superposed on the mean flow. It is shown that instability increases with shear, lapse rate and latitude and decreases with wave length; the mid-latitude westerlies are found by these criteria to be a seat of constant instability. The calculated and observed characteristics of the perturbations agree. The fields of horizontal mass divergence and vertical momentum component are calculated; the surface of zero divergence is found to slope from trough to wedge line. *Subject Headings:* **Atmospheric circulation, Instability.**—*C.E.P.B.*

2.11–72 551.511:551.513.1

Masuda, Y., **Dynamics of baroclinic disturbances in the upper troposphere.** *Papers in Meteorology and Geophysics*, Tokyo, 1(2–4):188–197, Dec. **1950.** 3 figs., 8 refs., 38 equations. **DWB**—Author investigates the effect of a variation of the speed of the zonal westerly current on which is superposed a small horizontal baroclinic disturbance in the form of a complex sinusoidal wave. One factor of this wave becomes unstable when the zonal current falls below a critical value which depends largely on the temperature gradient. This is the beginning of the blocking process. An attempt is made to evaluate the critical velocity. *Subject Headings:* **Dynamics of the atmosphere, Upper troposphere, Atmospheric disturbances.**—*C.E.P.B.*

2.11–73 551.511:551.513.1:551.509.312

Matsumoto, S., **On the coupling between upper waves and surface pressure centers.** *Papers in Meteorology and Geophysics*, Tokyo, 1(2–4):198–205, Dec. **1950.** 4 refs., 17 equations. **DWB**—Assuming that the upper wave has been predicted, author develops an improved surface tendency equation taking account of upper change of pressure, advection of surface air, upper and surface winds and vertical motion. He gives a numerical expression for speed of surface pressure center and applies it to an anticyclone in Japan in November. *Subject Headings:* **Anticyclogenesis, Cyclone forecasting.**—*C.E.P.B.*

2.11–74 551.513.1:551.547:551.587

Sutcliffe, R. C., **Mean upper contour patterns of the Northern Hemisphere—the thermal-synoptic view-point.** *Royal Meteorological Society, Quarterly Journal*, 77(333):435–440, July **1951.** 2 figs., 10 refs. **MH-BH**—A reexamination of the evidence from which B. BOLIN (1950) deduced that the main troughs and ridges in middle and upper troposphere are due to

waves in the westerlies caused by mountain barriers. Against this, author puts forward view that the mean upper contour pattern is due to direct thermal processes resulting from land and sea distribution, modified by synoptic baroclinic developments. *Subject Headings:* **Dynamics of the atmosphere, Waves in the westerlies, Upper air pressure, Upper air climatology.**—*C.E.P.B.*

ATMOSPHERIC DISTURBANCES

2.11–75 551.515.1:551.555.6(82)

§Schwerdtfeger, Werner, **Das thermische Tief im nordwesten Argentiniens.** [The thermal low in northwest Argentina.] *Meteorologische Rundschau*, 4(3–4):49–52, March–April **1951.** 3 figs., 4 tables, 9 refs. **MH-BH**—In summer, a thermal low forms into which cold south winds break quasi-periodically. There is a high negative correlation between interdiurnal pressure and temperature changes. The cycle involves about 4 days warming by 2°C./day and 2 days cooling by 4°/day. In winter, correlation is smaller and depression is a lee effect. *Subject Headings:* **Atmospheric disturbances, Argentina.**—*C.E.P.B.*

2.11–76 551.515.1:550.342(492)

ten Kate, H., **Stormen en microseismen.** [Storms and microseisms.] *Hemel en Dampkring*, 49(6):101–106, **1951.** 2 figs. **DLC**—An informative article on the history of microseisms in relation to weather, beginning with the work of Bertelli in Florence (1874) and the attempt at forecasting from microseisms made in Holland during the war of 1914–18, and continuing with research made in France and America in connection with severe storms or hurricanes. The origin and propagation of microseisms and the most recent theories regarding relation of microseisms to storm center and to periodicities in solar phenomena are discussed. *Subject Headings:* **Microseisms, Cyclonic activity, Netherlands.**—*M.R.*

2.11–77 551.515.11:551.555.6(73)

§Rodewald, Martin, **Die Unwetterkatastrophe im Nordosten der Vereinigten Staaten vom 25. bis 26. November 1950.** [The bad weather catastrophe in northeast United States, Nov. 25–26, 1950.] *Naturwissenschaften*, 38(14):313–323, July 16–31, **1951.** 14 figs., 12 refs. **MH-BH**—A 3-dimensional account of one of the worst United States cold waves on record, accompanied by a gale up to 100 mi./hr. and 45–95 cm. new snow. A "cold dome," travelling SE from northwest Canada, caused a frontal zone at 500 mb. and a rapid advance of the cold pressure wave. A 3-air mass hurricane-like low developed off Cape Hatteras (illustrated by a series of charts). The cold surface air wave was accompanied by an intense high-level cyclone, and the Hatteras depression travelled northwards over land, causing a renewal of blizzards. *Subject Headings:* **Dynamics of the atmosphere, Cyclogenesis, Blizzards, Northeastern United States.**—*C.E.P.B.*

2.11–78 551.515.11(41)

§Sumner, E. J., **Unusual deepening of a frontal depression over the British Isles.** *Meteorological Magazine*, London, 80(947):130–139, May **1951.** 6 figs., 3 refs., 2 equations. **MH-BH**—The depression of Oct. 24–25, 1945 is analyzed in the light of R. C. Sutcliffe's 1947 theory of development in relation to the thermal field, with the addition of a term for vertical motion due to instability. It is concluded that "when near neutral or actual instability exists or is likely to be realized by a small amount of lifting, particularly rapid and intense developments are to be expected." *Subject Headings:* **Deepening, Dynamics of the atmosphere, British Isles.**—*C.E.P.B.*

2.11–79 551.515.13(73)

§Kibler, C. L., **The deepening storm over Illinois on April 11–12, 1951.** *Monthly Weather Review*, 79(4):74–80, April **1951.** 14 figs., 4 refs. **DWB**—A synoptic case-history study of a wave which formed over Northern Texas, moved toward Illinois as it deepened, looped and then moved eastward again, filling as it reached Lake Michigan. Attending weather conditions, as well as the aerological and isallobaric conditions, are discussed. *Subject Headings:* **Deepening, Synoptic studies, Mississippi Valley.**—*M.R.*

2.11–80 551.515.2(529)

§**On Taiwan typhoons during the recent 50 years (1897–1946).** Formosa, Weather Bureau, **1948.** 31 p. figs., tables. In Japanese, English summary p. 30–31. **DWB**—The monthly frequency distribution of typhoons (listed in extensive appendix with much pertinent data) which crossed Formosa between 1897 and 1946 is calculated and the tracks of these storms plotted on charts for each of the months from May to October and are compared with all typhoons originating in the western Pacific. Typhoons are classified according to 3 intensities, those which are most intense only occurring in July–September, speed of movement and course are not uniform, though the usual speed is from 3–20 m.p.h. Rainfall distribution near typhoons is also studied and examples showing isohyetal charts and synoptic situation for some of the remarkable ones are given. Forecasts and warnings, damage and loss of life are also discussed. *Subject Headings:* **Typhoons, Typhoon statistics, Formosa.**—*M.R.*

2.11–81 551.515.2:551.577.2(52)

*§**Typhoon record of Japan.** Japan, Central Meteorological Observatory, May **1944** - June **1950.** 3 v. numerous charts. In Japanese. **DWB** Vol. I contains a tabulation of 570 typhoons by month (50% were in Aug. and Sept.) and year for 52 years (1889–1940), and numerous charts showing paths of individual typhoons which affected Japan. Vol. II gives the same for the years 1941–1947 (112 storms); Vol. III gives detailed charts of the path of the typhoon and the pressure and wind system over the immediate coast of Japan, and the incidental rainfall distribution (isohyetal lines for 30, 50, 100, 150, 200, 300, 400, 500 . . . and maximum), with an elaborate explanation in Japanese. This would be a useful work if translated into English. Much of the material appeared in Japanese periodicals between 1930 and 1940. *Subject Headings:* **Typhoon statistics, Typhoon tracks, Excessive rainfall, Japan.**—*M.R.*

2.11–82 551.515.22(263)

§Gordon, A. H., **The severe hurricanes of August, 1949, in the Bahamas and Florida.** *Marine Observer,* 21(153):197–199, July **1951.** 3 figs. **DWB**—An account of the hurricanes of Aug. 21–25 and Aug. 24–29 from the point of view of the SS Mataroa which passed through the region of development. *Subject Headings:* **Hurricanes, Atlantic Ocean, Bahama Islands, Florida.**—*C.E.P.B.*

2.11–83 551.515.3

Gordon, A. H., **Waterspouts. Pt. II.** *Marine Observer,* 21(152):87–93, April **1951.** 2 figs. **DWB**—Frequencies of waterspouts with different meteorological conditions, and diurnal and annual variations are discussed (maximum day time, Oct. in Northern and April in Southern Hemisphere, secondary maximum in spring). Most favorable condition—superadiabatic lapse rate in lowest 500 mb. Nine assisting factors are listed. Forecasting waterspouts briefly discussed. *Subject Headings:* **Waterspouts, Waterspout forecasting.**—*C.E.P.B.*

2.11–84 551.515.3(43)

Heybrock, Werner, **Trombe über dem Schwarzwald-Rand.** [Trombe over the Black Forest margin.] *Meteorologische Rundschau,* 4(5–6):111, May–June **1951. MH-BH**—Cloud spout from a CuNb near Schmieheim May 6, 1951. *Subject Headings:* **Tornadoes, Schmieheim, Black Forest, Germany.**—*C.E.P.B.*

2.11–85 551.515.3(266.5)

Thorp-Hincks, P. M., **Heavy squall with waterspouts. Red Sea.** *Marine Observer,* 21(153):158–159, July **1951.** 2 figs. **DWB**—On July 26, 1950, in Red Sea a heavy squall crossed the ship. Pressure fell 5 mb. and temperature 16°F. Three waterspouts seen. In N. Pacific (9°14′N., 85°53′W.) a waterspout was seen on Sept. 8, 1950. *Subject Headings:* **Waterspouts, North Pacific Ocean, Red Sea.**—*C.E.P.B.*

2.11–86 551.515.4:629.13

Brooks, Charles F., **The thunderstorm vs the airline.** *American Meteorological Society, Bulletin,* 32(4):145, April **1951. MH-BH**—A summary of the synoptic conditions prevailing during the flight which crashed on June 23, 1950 in Lake Michigan. The accident is attributed

either to structural failure caused by turbulence or loss of control which might have been caused by lightning or altimeter error. The author calls attention to the need for taking into account thunderstorm hazards during "all weather" flying. *Subject Headings:* **Thunderstorms, Aeronautical meteorology.**—*I.L.D.*

2.11–87 551.515.7:551.543(79,711)

§Miller, Albert and Gould, Donnel H., **The extensive cold air outbreak of January 24–31, 1951.** *Monthly Weather Review*, 79(1):20–26, Jan. **1951.** 17 figs., table, 5 refs. **DWB**—On January 28, 1951, the pressure at the center of the Pacific Northwest anticyclone reached 1065 mb., which is nearly a record for America (1070 mb. at Dawson, Jan. 6, 1909 was highest for Western Hemisphere, and 1079 at Barnaul, Siberia, Jan. 23, 1900 highest for the world.) Surface 700 and 500 mb. synoptic charts for each day and upper air soundings for Whitehorse and Norman Wells are included as well as a discussion of the consequences on the weather in the United States. *Subject Headings:* **Cold waves, Pressure extremes, Pacific Northwest.**—*M.R.*

2.11–88 551.515.8:551.515.4

Faust, Heinrich, **Böenstärke und Temperaturfall bei Wärmegewittern.** [Squall strength and temperature fall in heat thunderstorms.] *Meteorologische Rundschau*, 4(3–4):68–70, March–April **1951.** table, 4 refs. **MH-BH**—Author previously found that increase of wind vector (m./s.) in a cold front squall is twice sudden fall of temperature (°C.). The same relation is now found to apply roughly to squalls accompanying heat thunderstorms, if a dry adiabatic gradient below condensation level precedes the squall. He infers that there is no difference between the dynamics of the two cases. *Subject Headings:* **Cold fronts, Squalls, Thunderstorms.**—*C.E.P.B.*

2.11–89 551.515.811

Lamb, H. H., **Essay on frontogenesis and frontolysis. Part II. Deformation field and circulations in the vertical plane.** *Meteorological Magazine*, London, 80(945):65–71, March **1951.** 3 figs., 6 refs. **MH-BH**—For Pt. I *see item* No. 2.8–75 in Aug. 1951 *Meteorological Abstracts*. The effect of general subsidence or ascent on the sharpness of fronts is discussed. The sharpening of discontinuities aloft by vertical convergence in an anticyclone over England is illustrated by a time section April 16–21, 1945. Cloud structure in warm sectors is discussed with examples. It typically shows clear lanes between cloud layers; conditions giving BERGERON'S model of solid deep clouds are set out. *Subject Headings:* **Frontogenesis, Frontolysis, Dynamics of the atmosphere.**—*C.E.P.B.*

2.11–90 551.515.811

§Lamb, H. H., **Essay on frontogenesis and frontolysis. Part III.** *Meteorological Magazine*, London, 80(946):97–106, April **1951.** 6 figs., 3 refs. **MH-BH**—Describes (with charts) frontolytic col with partial regeneration Feb. 14–16, 1946. Frontolysis through air mass assimilation is brought about by a stagnation, movement of air masses along parallel or the same track, and arrival in an unfavorable region. Strong ground heating with moderate subsidence is most effective in the first processes. A warm front travelling from a cold to a warmer region is a frequent geographical cause. An example of frontolysis in an occlusion on Jan. 12–13, 1946 is illustrated. This concludes the series of articles. *Subject Headings:* **Dynamics of the atmosphere, Frontogenesis, Frontolysis.**—*C.E.P.B.*

RADIATION AND TEMPERATURE

RADIATION

2.11–91 551.521.1

*Nicolet, M., Bossy, L. and Dogniaux, R., **Ensoleillement et orientation en Belgique. I.** [Insolation and orientation in Belgium. I.] *Belgium, Institut Royal Météorologique, Mémoires*, Vol. 32, **1949.** 41 p. 5 figs., 11 tables, 9 equations. **II. Étude pratique des surfaces verticales**

orientées. [Practical study of vertically oriented surfaces.] By M. Nicolet and L. Bossy. *Ibid.*, Vol. 36, **1950.** 49 p. 28 figs., 8 tables. **III. Étude de l'effet des conditions atmosphériques.** [Study of the effect of atmospheric conditions.] By M. Nicolet and R. Dogniaux. *Ibid.*, Vol. 40, **1950.** 53 p. 10 figs., 18 tables, refs., equations. **MH-BH**—A detailed study of the heat received from the sun. Pt. I opens with calculations based on solar constant, air mass and absorption at Uccle in very fine weather, giving hourly values on a surface normal to the sun and a horizontal surface. Pt. II gives corresponding ¼-hourly values of direct solar radiation on walls facing S., S.E. or S.W., E. or W., N.E. or N.W. and N. at 10-day intervals, also annual and diurnal variations of totals. In Pt. III effect of atmospheric conditions (mainly cloud) is introduced, using duration of bright sunshine and its relation to actionometer values. Effective insolation is tabulated by ½-hours and converted to energy under average conditions at Uccle on variously oriented surfaces. The memoirs contain many valuable tables and diagrams. *Subject Headings:* **Insolation, Solar heating, Belgium.**

2.11–92 551.521.12

*Dirmhirn, Inge, **Der Einfluss der Windrichtung auf die Globalstrahlung auf der Hohen Warte.** [The influence of wind direction on global radiation at the Hohe Warte (Observatory).] *Wetter und Leben*, 3(5–7):109–113, June **1951.** fig., 2 tables, 6 refs. **MH-BH**—The total radiation on a horizontal surface is tabulated seasonally for 8 wind directions (maximum with W–NW winds, minimum with SW, but with E in summer). Direct radiation is strongest with NW and weakest with E winds all year. *Subject Headings:* **Solar radiation data, Wind effects, Vienna, Austria.**—*C.E.P.B.*

2.11–93 551.521.12

Estimating insolation from atmospheric conditions. *U. S. Army, Corps of Engineers, Cooperative Snow Investigations, Research Note*, March 30, **1951.** 11 p. 2 figs., table, 7 refs. List of symbols. **DWB**—Twice daily estimates of hourly insolation, 1100 and 1700 hours, for the Central Sierra Snow Laboratory have been calculated during April 1949 and the values have been compared with those of incident radiation measured by laboratory pyrheliometer. The method of atmospheric depletion was used. A sample calculation is presented and both observed and calculated data on insolation are given in tables. Correlation coefficients between computed and observed data were +0.90 and 0.80 for morning and afternoon computations, respectively. Estimated atmospheric depletion fell below the observed values. *Subject Headings:* **Solar radiation, Correlation coefficients.**—*I.L.D.*

2.11–94 551.521.12

Sauberer, Franz, **Neue Messungen der Intensität der Sonnenstrahlung in Wien.** [New measurements of the intensity of solar radiation in Vienna.] *Wetter und Leben*, 3(5–7):122–125, June **1951.** 3 tables, 3 refs. **MH-BH**—Sets out monthly tables by 5° solar height, 1938–50, of intensity of solar radiation at Hohe Warte normal to sun's rays and on a horizontal surface, hourly means on a horizontal surface and sums on 15th of each month. These are lower than earlier values owing to growth of the city. *Subject Headings:* **Solar radiation data, Vienna, Austria.**—*C.E.P.B.*

2.11–95 551.521.13

Wegener, Kurt, **Die wirkliche Solarkonstante.** [The true solar constant.] *Geofisica Pura e Applicata*, 19(3–4):170–172, **1951.** ref. **MH-BH**—Average and extreme values of the solar constant, according to various authors, are enumerated and the value of 2.4 given as the "true" value, after corrections for atmospheric radiation and albedo of bulb had been applied to numerous observations made at La Quiaca, Argentina (3400 m.) during December 1950. The actual high value of 2.47 for the southern summer is in keeping with the anomaly due to proximity of the sun at that season. *Subject Headings:* **Solar constant, La Quiaca, Argentina.**—*M.R.*

2.11–96 551.521.13

Wegener, Kurt, **Messungen der Sonnenstrahlung zur Prüfung der Solarkonstante.** [Measurements of solar radiation as a check on the solar constant.] *Meteorologische Rund-*

schau, 4(5–6):109–110, May–June **1951.** German and Spanish summaries p. 109. **MH-BH**—Observations were made at Pilar (300 m.) and La Quiaca (3400 m.), some of the latter giving actual values exceeding 2 cal./cm.²/min. The value of 1.94 for the solar constant, adopted in 1913, does not satisfy the observations and it is concluded that the sun does not radiate according to the Boltzmann-Stefan Law. *Subject Headings:* **Solar radiation, Solar constant, Argentina.**—*C.E.P.B.*

2.11–97 551.521.14:551.578.4

*U. S. Army, Corps of Engineers, **Albedo of the snow surface as related to weathering factors and stage of the season.** San Francisco, Calif., U. S. Army, Corps of Engineers, South Pacific Div., Dec. 11, **1950.** 11 p. tables, 3 refs., figs., tables and glossary, appends. **DWB**—An attempt is made to use an index of accumulated heat supply since the latest snowfall to indicate the amount of weathering of snow. A mathematical relationship is established between the albedo of a snowpack and either the accumulated summation of the daily incident radiation or the sum of daily maximum temperatures since the latest snow fall. Daily incident and reflected radiation was measured by an Eppley pyrheliometer and regression curves were fitted visually and mathematically by ordinary statistical methods. Mean daily values of albedo were found to be highly positively correlated with hourly albedo values during the rapid-melt portion of the day. Values of albedo declined progressively with accumulated heat supply and thus were related closely to degree of weathering during each interstorm period. Albedo also shows a downward trend with seasonal progress. An example of the loss of energy of a snow surface due to higher albedo of the snow surface during and after a late-spring storm is presented and the application of the assumption of a critical albedo sequence to practical design problems is discussed. The appendix contains basic data for the albedo study, data on morning and afternoon variations of albedo and the mathematical equations of the curves. *Subject Headings:* **Albedo of snow, Solar radiation, Snow cover.**—*I.L.D.*

2.11–98 551.521.3

Yamamoto, Gi-ichi and Onishi, G., **Absorption of solar radiation by water vapour in the atmosphere.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(4):103–119, April **1951.** 12 figs., 3 tables, 21 refs., 25 equations. In Japanese, English summary p. (119). **MH-BH**—Numerous graphs and tables (with titles in English) give the absorption of solar radiation by water vapor for the stratosphere and troposphere for any height and zenith distance of the sun. From these values, the total absorption from the top of the atmosphere to any given height is obtainable. The rate of temperature rise, due to this absorption in the troposphere, is also calculated and shown graphically. Absorption for oblique incidence for 0°, 30°, 50° and 70° for a model atmosphere is also given in a nomogram. Finally, the results are compared with those of FOWLE, which are larger, and with those of KIMBALL and HOELPER, which are nearly the same. *Subject Headings:* **Solar radiation, Absorption by water vapor.**—*M.R.*

2.11–99 551.521.7:523.75

Machin, K. E., **Distribution of radiation across the solar disk at a frequency of 81.5 mc./s.** *Nature*, London, 167(4257):889–891, June 2, **1951.** 2 figs., 7 refs., equation. **DWB**—Interference patterns between reception on 6 aerials at different distances gave distribution of radio brightness as a ratio to equivalent blackbody radiation, decreasing asymptotically from near 1 at center to zero beyond 3 photosphere diameters. Compared with theoretical distribution. *Subject Headings:* **Solar radiation, Blackbody radiation, Sunspots.**—*C.E.P.B.*

TEMPERATURE

2.11–100 551.524.35

*Reidat, R., **Über die Abweichungen vom Monatsmittel in der 80 jährigen berliner Temperaturreihe 1851–1930.** [On the departures from the monthly mean in the 80 year Berlin temperature series, 1851–1930.] *Zeitschrift für Meteorologie*, 5(7–8):224–229, July–Aug. **1951.** 6 tables. **MH-BH**—Frequencies of temperature departures, relations to departures of 4 preceding and 6 following months, and sequences of months with departures of the same sign are tabulated. The results throw some light on planetary and geographical influences on

climate but are not sufficiently definite for forecasting. *Subject Headings:* **Temperature frequencies, Planetary influences, Berlin, Germany.**—*C.E.P.B.*

2.11–101 551.524.36:551.576.3

Faust, Heinrich, **Extremtemperaturen bei Aufheiterungen nach einer Schlechtwetterperiode.** [Extreme temperatures during clearing after a period of bad weather.] *Meteorologische Rundschau*, 4(5–6):99–100, May–June **1951.** 2 figs. **MH-BH**—Author calculates change of maximum and minimum temperature on first fine calm day after a period of overcast weather at Bad Kissingen, for each month. In each season the relation of the changes to the minima and maxima 24 hours before are shown on diagrams. *Subject Headings:* **Temperature frequencies, Cloud dissolution, Bad Kissingen, Germany.**—*C.E.P.B.*

2.11–102 551.524.36

Hartmann, Wilhelm, **Die Abnahme der Sommertage mit der Höhe im Harz.** [The decrease of summer days with height in the Harz.] *Zeitschrift für Meteorologie*, 5(7–8):250–253, July–Aug. **1951.** 5 tables. **MH-BH**—The number of "summer days" (maximum temperature exceeding 25°C.) in each month at stations in Harz, $h = 130$ to 1150 m., is represented by $C_1 - C_2 \log h$. For year $C_1 = 98.4$, $C_2 = 32.6$, mean error 2.8 days. *Subject Headings:* **Temperature frequencies, Harz Mountains, Germany.**—*C.E.P.B.*

2.11–103 551.524.36

van der Bijl, W., **Een warmte-record op "Eismitte."** [A heat record at Eismitte.] *Hemel en Dampkring*, 48(12):215–216, Dec. **1950. DLC**—It is reported for the first time that on June 21, 1950 the temperature at Eismitte rose above 0°C. The mean daily temperature was −1.4°C. and light rain fell at 1500 hr. The preceding day the barometric pressure attained 709 mb., snow mixed with rain drops fell from stratocumulus clouds; southerly winds and cloud cover at night prevented extreme drop in temperature. In 1930–31 WEGENER reported an absolute maximum of −2.8°C. and mean of −6.2°C. for the warmest day. On Feb. 22, 1950 a mean daily temperature of −63.4°C. and a minimum temperature of −66°C. were reported. The absolute minimum, March 1931 was −64.8°C. *Subject Headings:* **Temperature extremes, Eismitte, Greenland.**—*I.L.D.*

2.11–104 551.524.37

Angus, D. E., **Inclined axis frost fan trials in citrus orchards.** *Australia, Scientific and Industrial Research Organization, Section of Meteorological Physics, Sectional Report* No. 1, Jan. **1951.** 24 p. diagrs., tables, graphs, refs. Mimeographed. **DWB**—Continuing previous work on the efficiency of wind machines for protection of orchards against frost, trials made in 1950 with a fan which could be tilted vertically, showed that a progressive increase in area and range of temperature rise (2°F.) occurred as the fan was tilted up to a maximum of 62° from the vertical. Details of experiments made at Griffiths, New South Wales, are tabulated. *Subject Headings:* **Frost prevention, Wind machines, Australia.**—*M.R.*

2.11–105 551.524(492)

Cannegieter, H. G., **Tweeënvijftig winters.** [Fifty-two winters.] *Hemel en Dampkring*, 49(4):70, **1951.** fig. **DLC**—A single chart shows the duration and intensity of freezing weather during the winter months (Nov. 10–April 1) for each year from 1898 to 1950. Not only are the severe winters shown vividly, but the mild ones stand out in contrast. The data are presumably for some station in Netherlands. *Subject Headings:* **Severe winters, Graphical presentation, Netherlands.**—*M.R.*

2.11–106 551.524(74)

Conover, John H., **Are New England winters getting milder?** *Weatherwise*, 4(1):5–9, **Feb. 1951.** 3 figs., 2 tables. **MH-BH**—Air temperature, snow fall, days of snow cover and frozen period of ponds are analyzed at Blue Hill Observatory for the period 1885–1950. A severity index is calculated. It is concluded that over the period of analysis the winter severity shows an overall decline but no marked decline over the last 25 years. The data are presented in tables. *Subject Headings:* **Severe winters, New England.**—*I.L.D.*

2.11–107 551.524.4:551.510.3

Aujeszky, László, **A függöleges légoszlop levegöállapotainak jellemzése az allapotjelzök magasságszerinti differenciálhányadosaival.** [Some formulas for characterizing the vertical distribution of temperature, pressure and density in the atmosphere.] *Időjárás*, 53(11–12): 360–362, Nov.–Dec. **1949.** 10 equations. English summary p. 405. **MH-BH**—Theoretical treatment of formula for change in density with height when column of air is in static equilibrium, but with varying temperature lapse rates. *Subject Headings:* **Vertical temperature gradient, Atmospheric pressure.**—*M.R.*

PRESSURE AND WIND

PRESSURE

2.11–108 551.54:551.590.22

Vize (Wiese), V. IU., **Parallakticheskie atmosfernye prilivy v Arktike.** [Parallactic atmospheric tides in the Arctic.] *Problemy Arktiki*, No. 1:33–55, **1944.** 13 figs., 12 tables, 5 refs. **DGS**—A study of the relation between lunar months and atmospheric tides in the Arctic region, based on observations of baric waves in Tixy Bay and on Wrangel Island. *Subject Headings:* **Pressure waves, Atmospheric tides, Lunar influences, Wrangel Island, Soviet Arctic.**—*C.K.*

2.11–109 551.54:551.590.22

Vize (Wiese), V. IU., **K izucheniiu parallakticheskikh prilivov.** [Study of parallactic atmospheric tides.] *Problemy Arktiki*, No. 2:100–107, **1944.** 5 figs. **DGS**—After having discussed the problem of the relation between lunar months and atmospheric tides in the Arctic region (*ibid.*, (1):33–35, 1944) the author studies the phenomenon in other latitudes; a comparative analysis of the data leads him to the conclusion that parallactic tides exist in the atmosphere and that they are more pronounced in high latitudes. *Subject Headings:* **Atmospheric tides, Lunar influences.**—*C.K.*

2.11–110 551.543:551.515(43)

von Rudloff, Hans, **Starker Luftdruckanstieg und Andauer der nachfolgenden Wetterbesserung in Südwestdeutschland.** [Marked air pressure rise and the duration of the following weather improvement in southern Germany.] *Baden, Landeswetterdienst, Jahresbericht mit Abhandlungen*, **1950.** p. 79–84. 7 tables, 4 refs. **DWB**—All rises in barometric pressure which reached or exceeded 10 mm. Hg within 24 hours and which were registered at the Freiburg and Karlsruhe observatories between 1887 and 1950 have been analyzed with reference to the weather types that followed these increases in pressure. It was found that the calm weather which followed was usually of brief duration. *Subject Headings:* **Pressure variations, Weather types, Germany.**—*I.L.D.*

2.11–111 551.547:598.2

Gunn, William W. H. and Bagg, Aaron M., **Migrant birds are weatherwise!** *Weatherwise*, 4(2):34–35, April **1951.** 2 figs. **MH-BH**—A study of the relationship between the migratory flights of birds and the prevailing pressure pattern has revealed that in Central and Eastern United States migration occurs when such regions lie within the western portion of a high pressure area. The northward movement of birds occurs in light to strong southerly wind and relatively mild temperatures. An example, correlating the relationship between migrants and weather, is discussed and illustrated with weather maps. *Subject Headings:* **Pressure pattern flying, Bird migrations.**—*I.L.D.*

2.11–112 551.547.1

Perlat, A., **Note sur la correction des indications d'un altimèter en fonction de la température de l'air observée au niveau du vol.** [Note on the correction of altimeter readings as a function of the air temperature observed at flight level.] *Journal Scientifique de la Météorologie*, 3(10):57–61, April–June **1951.** French, English and Spanish summaries p. 57.

fig., table, equations. **MH-BH**—A statistical study has been made of the altimeter corrections for any given level, based on the temperature at that level, in order to give a more accurate indication of height than could be obtained from a crude altimeter reading. Radiosonde observations at Trappes, Hanover, Maison-Blanche (Algiers), and Weathership-L were used in this study. *Subject Heading:* **Altimeter corrections.**—*M.R.*

2.11–113 551.547.2

Perlat, A. and Roulleau, J., **Atmosphère standard et altimétrie.** [Standard atmosphere and altimetry.] *Journal Scientifique de la Météorologie*, 3(9):26–35, Jan.–March **1951.** 3 figs., 3 tables, equations. French, English and Spanish summaries p. 26. **MH-BH**—A systematic and very practical study of the errors in altimeter readings which would be experienced at elevations from the surface to 18 km. over Paris (Trappes), Algiers (Maison-Blanche) and a position in the North Atlantic (Ocean Station "L"). In addition to a theoretical discussion of variations in height of pressure surfaces, tables and graphs show the actual magnitude of the errors in both + and − direction from the mean at any given elevation over the 3 stations, based on 3, 2 and 1 year of record, respectively. The statistical (95%) limits are also shown. Errors in other localities might be much greater. *Subject Headings:* **Altimeter errors, Pressure reduction.**—*M.R.*

WIND

2.11–114 551.551:551.507.321

van der Ham, C. J., **Interessante resultaten van enkele kinderballonwedstrijden.** [Interesting results of some toy balloon flights.] *Hemel en Dampkring*, 49(6):112–113, **1951. DLC**—An analysis of two releases of balloons in clusters, 950 balloons at Rijswijk, Holland on June 17, 1950 (of which 346 were recovered) and another release from Dordrecht on Sept. 30, 1950. The distribution of recoveries is shown in a chart in connection with the topography and flow at 850 mb. *Subject Headings:* **Balloon recovery, Turbulent diffusion, Topographic effects, Netherlands.**—*M.R.*

2.11–115 551.556:551.465(269)

Munk, Walter H. and Palmén, Erik, **Note on the dynamics of the Antarctic circumpolar current.** *Tellus*, 3(1):53–55, Feb. **1951.** 4 refs., equations. **MH-BH**—Assuming wind stress on the sea surface is balanced by frictional stress against the boundaries of the basin, the computed transports for most of the oceans differ from observed by a factor of 2. But in case of the Antarctic circumpolar (AC) current, the computed transport is 100 times the observed. So it is surmised that the stress arising from a westerly wind, operating over a sea with infinite fetch, is applied to the bottom or submarine ridges through successive stages and that the meridional exchange allows this to take place. Theory is briefly developed. *Subject Headings:* **Wind effects, Ocean currents, Antarctic Seas.**—*M.R.*

2.11–116 551.556:551.465:532.59

Yoshida, Kozo, **On the mechanism of the period increase of waves in storm areas.** *Tokyo University, Geophysical Institute, Geophysical Notes*, 3(24), **1950.** 8 p. 3 figs., table, 7 refs., 9 equations. In English. **MH-BH**—Using data from SVERDRUP and MUNK, author discusses change of energy distribution in the wave spectrum with increasing winds. The shorter waves develop first, but when they have reached the limiting steepness for their length, energy is transferred to the longer waves. The physical processes are obscure. *Subject Headings:* **Wind waves, Oceanography.**—*C.E.P.B.*

2.11–117 551.557:551.513.1

Aubert, Eugene J. and Winston, Jay S., **Comparison of monthly geostrophic and gradient winds with resultant rawins.** *Journal of Meteorology*, 8(2):126–127, April **1951.** 2 tables, 2 refs. **MH-BH**—Geostrophic and gradient winds are compared with resultant winds obtained from 24 U. S. rawin stations in 1948 (surface to 10,000 ft. and at 10,000 ft.). From a study of 100 cases, it was determined that the two methods give good agreement at the 10,000 ft.

level but not such good agreement in layer below 10,000 ft., because of frictional effects. This study also shows that on monthly mean charts the geostrophic or gradient wind can be used for the true wind. *Subject Headings:* **Geostrophic winds, Gradient winds.**—*M.R.*

2.11–118 551.557

Colón, José A., **On the wind structure above the tropopause over Puerto Rico.** *American Meteorological Society, Bulletin*, 32(2):52–53, Feb. **1951.** 2 tables, 3 refs. **MH-BH**—Results of 89 soundings, which reached 20 km. or more, are given in the form of wind roses for each km. level from 1 km. below the tropopause (16–17 km. s. l.) to 7 km. above the tropopause. At the tropopause the prevailing winds change from W or NW to ENE and the easterlies reach maximum frequency at 3 km. above tropopause and are about 6 km. deep. They are more pronounced in summer than in winter. *Subject Headings:* **Tropopause, Upper air winds, Krakatoa winds, San Juan, Puerto Rico.**—*M.R.*

2.11–119 551.557

*Vidal Llenas, José M. and Potau Gili, M., **Vientos en altura en Barcelona.** [Winds aloft at Barcelona.] *Spain, Servicio Meteorológico Nacional, Publicación, Ser. D*, No. 3, **1944.** 30 p. 46 figs., 41 tables, 6 refs. **DWB**—An analysis of the direction and velocity of the wind at elevations which ranged from 200 m. to 12,000 m. It is based upon 28,309 soundings and is presented in monthly summaries, tabularly and graphically. *Subject Headings:* **Upper air winds, Wind observation, Barcelona, Spain.**—*I.L.D.*

2.11–120 551.557.36

*Jansa Guardiola, José María, **Notas para una climatología de Menorca (Islas Baleares). Vientos en altura.** [Notes on the climate of Minorca (Balearic Islands). Winds aloft.] *Spain, Servicio Meteorológico Nacional, Publicación, Ser. A*, No. 12, **1943.** 49 p. figs., tables. German summary p. 5. **DWB**—Wind aloft data from pilot balloon soundings up to 8 km. summarized in tables and graphs for seasons and the year. Frequency of cloud heights and types also tabulated for 3 times a day. The monograph is devoted chiefly to large, detailed upper air wind roses (direction and speed separate). Brief discussion. *Subject Headings:* **Upper air wind data, Wind roses, Cloud height, Minorca, Balearic Islands.**—*M.R.*

2.11–121 551.558:797.5

Briegleb, William G., **Soaring for the power pilot.** *Flying*, 46(3):18–20, 58, March **1950.** photos. **DLC**—A popular article describing and illustrating how thermals and roll-clouds form over hills or valleys and how they may be used for soaring in sailplanes. *Subject Headings:* **Thermals, Vertical currents, Gliding.**—*M.R.*

2.11–122 551.558.1:629.13:797.5

Bleeker, Wouter; Heiërman, Johan Herman and Schmidt, F. H., **De Meteorologische Grondslagen van het Zweefvliegen.** [The meteorological basis of gliding.] Leiden, Leidsche Uitgeversmaatschappij, **1948.** 130 p. 24 photos, charts, 71 diagrs., tables. **DLC**—A nicely illustrated text for students of gliding, aeronautics or meteorology. The basic principles of general and synoptic meteorology are treated in the first few chapters, but most of the material has to do with thermals, cumulus clouds, orographic and topographic influences on air currents and vertical velocities, moist and dry thermals, leeward and dynamic gliding, etc. Excellent cloud photographs are included. *Subject Headings:* **Aeronautical meteorology, Vertical currents, Gliding.**—*M.R.*

2.11–123 551.558.21:629.135

Turner, H. S., **Standing waves and powered flight.** *Meteorological Magazine*, London, 80(946):106–109, April **1951.** 3 figs., 4 refs. **DLC**—Describes some examples of standing waves reported by pilots in lee of high ground, with illustrative tephigrams. Pilots reported difficulty in maintaining height. *Subject Headings:* **Lee waves, Aerial navigation.**—*C.E.P.B.*

AQUEOUS VAPOR AND HYDROMETEORS

HUMIDITY

2.11–124 551.571.7:551.508.822

Goldschmidt, Johannes, **Die Bestimmung des Niederschlagswassers der Atmosphäre aus Radiosondenaufstiegen und optischen Messungen.** [The determination of the precipitable water of the atmosphere from radiosonde ascents and optical measurements.] *Zeitschrift für Meteorologie*, 5(5-6):152–160, May–June **1951.** 5 figs., 9 refs., equations. **MH-BH**—Precipitable water calculated from radiosonde ascents in Wahnsdorf has good correlation with surface vapor pressure in summer, less good in winter. Errors of radiosonde method are discussed but this is so far the most accurate. Amounts estimated directly from actinometer measurements show little agreement with radiosonde data, but this is greatly improved by SCHÜEPP's method. The ideal would be measurements on special wave lengths. *Subject Headings:* **Upper air humidity, Instrumental errors, Precipitable water.**—*C.E.P.B.*

2.11–125 551.571

Kurdiani, I. G., **O vozmozhnykh minimumakh otnositel'noĭ vlazhnosti vozdukha.** [Possible minimum relative humidity of the atmosphere.] *Vsesoiuznoe Geograficheskoe Obshchestvo, Izvestiia*, 82(6):620–621, Nov.–Dec. **1950.** 3 refs., 8 equations. **DLC**—The difference between atmospheric vapor pressure determined by the ASSMAN psychometric formula and that by the formula of MAGNUS (in which vapor pressure is a function of dew point) is the basis for analyzing the errors inherent in measurements of minimal atmospheric relative humidities. It is shown that an isothermic curve of relative humidity is asymptotic to the abscissa or temperature axis so that the error in relative humidity increases at low values. *Subject Heading:* **Relative humidity.**—*I.L.D.*

2.11–126 551.571.3

*Gherzi, Ernest, **A humidade de Macau.** [The humidity of Macao.] *Macao, Observatorio Meteorológico, Notas Cientificas*, No. 1:1–7, **1951.** tables, ref. In Portuguese, English translation p. 11–15. **DWB** –A comparison is made between monthly mean values of relative humidity at Macao, Hong Kong, Canton and Swatow and for varying periods (17 and 20 years at Macao, 49 and 55 years at Hong Kong) as found in old and recent records. Speculations made as to the cause of the relative moistness of Macao over Hong Kong and the change in humidity (rise) noticed in each month between old and new records at the two places. The fact that Macao observations are for daytime hours only, whereas the recent Hong Kong observations cover 24 hours, would increase the significance of the anomaly, since it might be assumed that night observations give a higher relative humidity than daytime. *Subject Headings:* **Relative humidity, Macao, Hong Kong, China.**—*M.R.*

2.11–127 551.571.36

Needham, G., **Low humidity.** *Meteorological Magazine*, London, 79(941):326–327, Nov. **1950.** table, 7 refs. **MH-BH**—Quotes cases of relative humidity below 15% in Britain (lowest 9.5% in Dorset, May 24, 1901) and 2% at Shallufa (Suez Canal Zone) April 1, 1950. *Subject Headings:* **Humidity, England, Egypt.**—*C.E.P.B.*

2.11–128 551.571.7

Flohn, Hermann, **Zur vertikalen Verteilung des Wasserdampfes in der Atmosphäre.** [On the vertical distribution of water vapor in the atmosphere.] *Zeitschrift für Meteorologie*, 5(5–6):148–152, May–June **1951.** fig., 5 tables, 22 refs. **MH-BH**—SÜRING's and ROBITZSCH's formulas for variation of vapor pressure with height are compared with observations in various parts of the world; agreement is not good but this may be due partly to instrumental error. Author constructs sections of relative humidity along west coast of America 0–8 km., 0°–70° N., summer and winter, which clearly show different vertical variation in zones of mainly rising and sinking air. *Subject Heading:* **Upper air humidity.**—*C.E.P.B.*

2.11–129 551.571.7

Frith, Ronald, **Recent work of the Meteorological Research Flight of the Meteorological Office.** *Royal Meteorological Society, Quarterly Journal*, 77(333):478–480, July **1951.** 3 figs.,

3 refs. **MH-BH**—Examples of changes of temperature and frost point between 20–40,000 ft. are shown. About half the ascents give a sharp fall of frost point at tropopause, mainly when tropopause is also sharp; others show the fall thousands of feet below. Mean lapse of frost point below tropopause is 3.5°F./1000 ft., above, 5°/1000 ft. to −100°F., then constant at −110°. *Subject Headings:* **Upper air humidity, Tropopause, Frost point.**—*C.E.P.B.*

2.11–130 551.573

Haude, Waldemar, **Zur Bestimmung der Verdunstung mit Hilfe von im Boden eingesetzten Töpfen.** [On the determination of evaporation with the help of pots set in the ground.] *Zeitschrift für Meteorologie*, 5(5–6):139–143, May–June **1951.** fig., table, 4 refs. **MH-BH**—In Langenhagen, glazed clay pots ½ and 1 m. deep were sunk in soil with a central gage. They were filled with soil or sand, and bare or grass-covered. Evaporation-precipitation was measured by fluctuations of water level or by water added or abstracted to keep level fixed. Runoff of a nearby stream was also measured. Figure shows results April–Oct. 1950. *Subject Headings:* **Evaporation measurement, Runoff.**—*C.E.P.B.*

2.11–131 551.573

Poppendiek, Heinz F. and Tribus, Myron, **A comparison of several heat and mass transfer networks of interest in water conservation.** *American Geophysical Union, Transactions*, 32(1):49–56, Feb. **1951.** 9 figs., 16 refs., 10 equations. **MH-BH**—Based on previous works of various authors, several electrical networks for heat and mass flow in an open earth field system, a snowbank system, a lake network and a network of U. S. Weather Bureau Evaporation Pans are proposed and the necessary instrumentation discussed and illustrated. Theoretical aspects are also treated and the relation between resistances for convection and evaporation measurements worked out graphically and discussed. Purpose of experiments would be to predict evaporation from lakes and reservoirs. *Subject Headings:* **Evaporation forecasting, Energy exchange, Lakes and reservoirs, Water supply.**—*M.R.*

CLOUD PHYSICS

2.11–132 551.574.1

Facy, L., **Embruns et noyaux de condensation.** [Sea spray and condensation nuclei.] *Journal Scientifique de la Météorologie*, 3(10):62–68, April–June **1951.** 6 figs., 9 refs. French, English and Spanish summaries p. 62. **MH-BH**—It was found that large drops of sea spray can be split into numerous condensation nuclei when humidities are low (30–35%). Photographs are presented showing size, shapes and spacing of nuclei when formed in various conditions of humidity and air flow in the laboratory. There is also a discussion of the differences between natural and laboratory conditions and of the size and chemical content factors. *Subject Headings:* **Condensation nuclei, Sea spray.**—*M.R.*

2.11–133 551.574.1

Hyde, W. Lewis, **The freezing of super-cooled water.** *U. S. Office of Naval Research, London, Technical Report* No. ONRL-27-51, March 28, **1951.** 3 leaves. **DWB**—The apparatus and method used by A. W. Brewer and R. H. Dobson to test W. Rau's assertion, that water can be supercooled to −72°C. without freezing, is described. Rau's finding could be duplicated only if water contaminated with alcohol was used. Normal water, free of contamination, was found to freeze at temperatures between −20°C. and −30°C. *Subject Headings:* **Supercooled water, Freezing nuclei.**—*I.L.D.*

2.11–134 551.574.1:551.591.1

Ogiwara, S. and Ôkita, T., **The size distribution of sea-salt nuclei and its contribution to visibility.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(4):119–129, April **1951.** 10 figs., 2 tables, 15 refs., 11 equations. In Japanese, English summary p. (129). **MH-BH**—Observations made near Sendai, Japan, are discussed and illustrated by electron microscope photographs of particles and curves showing frequency distribution of size of particles observed in the atmosphere. The size distribution is represented by the formula $N_0\gamma_0^3 = C$ where $N_0\Delta\gamma_0$ is the number of sea-salt nuclei contained in 1 cc. of the atmosphere, and $C = 2.2W \times 10^2$,

where W is the amount of sea-salt in 1 cc. of the atmosphere. Relative humidity variations with respect to number and size of nuclei and, finally, visibility (opacity) with respect to relative humidity are formulated and presented graphically. Results also calculated for Valentia data in terms of the authors. *Subject Headings:* **Condensation nuclei, Saline nuclei, Visibility, Sendai, Japan.**—*M.R.*

2.11–135 551.574.7

Howell, Wallace E., **A comparison of icing conditions on Mount Washington with those encountered in flight.** *American Geophysical Union, Transactions,* 32(2):179–188, April **1951.** 13 figs., 19 refs., 3 equations. **DWB**—Icing clouds have been studied on Mt. Washington for 15 years. Temperature is lower, liquid water content and drop-size spectrum are similar to those observed in flight, but scale of ice accretion in natural winds on Mt. Washington is less than that in flight by about one-fifth. *Subject Headings:* **Icing in clouds, Icing of aircraft, Mount Washington, New Hampshire.**—*C.E.P.B.*

2.11–136 551.574.7:629.13

Lucking, D. F., **Indication measurement and control of ice accretion.** *Royal Aeronautical Society, Journal,* 55(486):382–385, June **1951.** 4 refs. **DWB**—A device for measuring intensity of ice accretion on an airplane was patented by the author in February 1950, but the patent has been dropped. It operates on the principle of the differential between continuously anti-iced and intermittently de-iced surfaces of several sizes. Another group of devices was patented in February 1951 which operated on the principle of period of forced vibration rather than air drag. *Subject Headings:* **Icing of aircraft, Ice accretion measurements, Aeronautical meteorology.**—*M.R.*

2.11–137 551.575.1

§Nurminen, Aili, **Wind convergence as a factor in persistent radiation fog.** *American Meteorological Society, Bulletin,* 32(2):72–73, Feb. **1951.** 2 figs., 3 refs. **MH-BH**—Two cases where radiation fog lasted all day at Turku and Helsinki airports are analyzed synoptically and explained on the basis of a change from anticyclonic to cyclonic curvature of the isobars and consequent convergence in a homogeneous air mass. *Subject Headings:* **Radiation fog, Helsinki, Finland.**—*M.R.*

2.11–138 551.575.2(41.2)

*Durst, C. S., **Winter fog and mist investigation in the British Isles, 1936–7.** Great Britain, Meteorological Office, **1940.** 85 p. 3 figs., chiefly tables. **DWB**—A detailed statistical and observational study of fog and visibility was made during Jan.–March 1936, and Sept. 1936 to March 1937 in the British Isles. Observations of visibility of objects at 200 yards, 1100 yards and $1\frac{1}{4}$ mile were made at about 1000 stations fairly well scattered throughout England, Scotland, Wales and Ireland. Frequencies at various hours of the day in different seasons are tabulated in detail and summarized. Fog is classified as radiation, advection, hill and mixing fog. Topographic effects, association with wind speed and with proximity to urban areas are discussed. Data are listed by counties. *Subject Headings:* **Winter fog, Fog distribution, British Isles.**—*M.R.*

2.11–139 551.576.1:551.543.3

§Tepper, Morris, **On the desiccation of a cloud bank by a propagated pressure wave.** *Monthly Weather Review,* 79(4):61–71, April **1951.** 9 figs., table. **DWB**—A remarkable case of an eastward moving pressure wave and a more slowly moving cloud formation which passed simultaneously over Washington, D. C., on Dec. 6, 1949, is analyzed in detail and illustrated with synoptic charts, cross sections, isochronal charts of pressure and time of arrival of the cloud bank between Chicago and the Atlantic Coast, microbarograph and solar radiation traces and a cloud photograph. Wind aloft data indicate possibility of cloud bank being advected, but the pressure wave could not have moved at the speed of the wind: hence, the theory that the pressure wave overtook the cloud bank just at Washington, D. C. and caused it to dissipate. The mechanism of this dissipation is explained through a drop in the isentropic

surface accompanying the pressure rise. *Subject Headings:* **Cloud formations, Pressure waves, Washington, D. C.**—*M.R.*

2.11–140 551.576.11

Stommel, Henry, **Entrainment of air into a cumulus cloud II.** *Journal of Meteorology*, 8(2):127–129, April **1951.** 5 figs., table, 5 refs., equations. **MH-BH**—A short, theoretical treatment of the vertical velocity distribution in a trade wind cumulus. Two examples of vertical velocity distribution are treated, using soundings made by BUNKER and others (1949) and the computed entrainments from STOMMEL (1947). Detailed data, as computed, are given for elevations from 2000 to 6500 ft. in one case and 2000 to 5000 ft. in the other. The author questions the accuracy of results thus obtained (velocities as high as 27.4 ft./sec.) assuming a steady-state model. *Subject Headings:* **Entrainment, Vertical velocities, Cumulus cloud formation.**—*M.R.*

RAINFALL—DROUGHT

2.11–141 551.582.2:551.577(474.1)

Korhonen, V. V., **Die mittlere Niederschlagshöhe in Finnland in den Jahren 1886–1935.** [Mean amount of precipitation in Finland during 1886–1935.] *Finland, Ilmatieteellisen keskuslaitoksen, Toimituksia*, No. 34, **1951.** 17+14 p. maps, 12 refs. In German. **DWB**—Monthly and annual charts of mean precipitation for the 50 year period, 1886–1935, presented. These charts are prepared in a novel fashion. The actual or interpolated values are plotted for 1° square of lat. and long. and isolines drawn for every 10 mm. interval (monthly charts). Corrections were made for the wind factor during months where snow was recorded. A 13 page discussion includes the history of rainfall charts of Finland since WILD's in 1887 and a critique of former charts. By the present method it is possible to get an unbiased estimate of the total or average precipitation for all of Finland or for any part thereof for any month or season. *Subject Headings:* **Precipitation charts, Long period records, Finland.**—*M.R.*

2.11–142 551.577.11:621.396.9

Bowen, E. G., **Radar observations of rain and their relation to mechanisms of rain formation.** *Journal of Atmospheric and Terrestrial Physics*, 1(3):125–140, **1951.** 7 figs., 3 tables, 16 refs. **MH-BH**—Investigations of radar echoes from rain at Sydney, New South Wales, in conjunction with upper air ascents show two types. A band of high echo just below freezing level is due to melting of ice particles and is associated with formation of rain in a mixture of supercooled droplets and ice needles. In such clouds another band may be formed at −16°C. by spontaneous freezing of large drops. The second type, columnar echoes from convection clouds, is due to coalescence of cloud droplets without ice particles. (*See item* 2H–165 in Aug. 1951 *Meteorological Abstracts*.) *Subject Headings:* **Rain formation, Radar echoes.**—*C.E.P.B.*

2.11–143 551.577.11:551.576.11

Schirmer, Hans, **Niederschlagsstreifen—Spurlinien von Wolkenstrassen.** [Precipitation streaks—traces of cloud-lanes.] *Meteorologische Rundschau*, 4(5–6):97–99, May–June **1951.** fig., 7 refs. **MH-BH**—"Streaks" of precipitation 5–15 km. wide and 50–130 km. apart in southwest Germany on Sept. 18–19, 1946, are related to showers, sometimes thundery, from clouds arranged in lines. *Subject Headings:* **Cloud lanes, Precipitation bands, Germany.**—*C.E.P.B.*

2.11–144 551.577.2:551.509.22(54)

*Boothalingam, P. N. and Srinivasan, V., **A study of the distribution of rainfall in the Peninsula associated with some pre-monsoon storms.** *India, Meteorological Dept., Scientific Notes*, 11(132):9–15, **1950.** 29 figs., tables. **DWB**—Rainfall data and charts, and storm tracks for five storms which occurred during the pre-monsoon season between 1930 and 1943 are presented. It is shown that the pattern of rainfall distribution with respect to the storm track is changed by using data from all 3000 rainfall stations instead of that from 200 first order stations used in previous analyses. Total amount of water precipitated and area of fall on each day for the 5 storms (32 days in all) and area affected is given in tables. Rules useful for forecasting also indicated. *Subject Headings:* **Rainfall distribution, Pre-monsoon storms, Rainfall forecasting, India.**—*M.R.*

2.11–145 551.577.2:551.509.67

Schwerdtfeger, Werner, **Gedanken über ein Ausgleichs-Prinzip des atmosphärischen Gesamt-Niederschlages.** [Idea on a smoothing principle for total atmospheric precipitation.] *Meteorologische Rundschau*, 4(5–6):96–97, May–June **1951.** German and English summaries p. 96. **MH-BH**—Author argues that the total annual precipitation over the globe is determined entirely by the incoming solar energy and is therefore nearly constant from year to year. Consequently, an artificial increase of precipitation in one region can only be obtained at the expense of a decrease in some other region. *Subject Headings:* **Precipitation distribution, Artificial precipitation.**—*C.E.P.B.*

2.11–146 551.577.3

Gilman, C. S. and Riedel, J. T., **Persistence of extremely wet and extremely dry months in the United States.** *Monthly Weather Review*, 79(3):45–49, March **1951.** 13 tables, 10 refs. **DWB**—Monthly rainfall data for 50 stations in the United States were analyzed statistically for persistence of extremely dry or extremely wet months. The results are shown for some of the stations and indicate that no significant persistence of wet months can be found, and only slightly greater persistence of dry months, insofar as the X^2 test is valid. Previous studies for Hawaii and Great Britain are cited. *Subject Headings:* **Persistence, Precipitation variations, United States.**—*M.R.*

2.11–147 551.577.37:551.579.4

§Miller, Albert, **Heavy rainfall in Mississippi and Alabama on March 27 to 29, 1951.** *Monthly Weather Review*, 79(3):55–60, March **1951.** 11 figs., 8 refs., equation. **DWB**—Synoptic and statistical analysis of a situation that produced widespread floods in the Lower Mississippi Basin. The source of moisture, amount transported and precipitated, the relation to the *jet stream* and upper air conditions, as determined from radiosonde observations, are discussed and illustrated. *Subject Headings:* **Excessive rainfall, Floods, Mississippi Valley.**—*M.R.*

2.11–148 551.577.38:333.72

Dale, Tom, **For insurance against drought; soil and water conservation.** *U. S. Dept. of Agriculture, Farmers Bulletin* No. 2002, March **1950.** photos. **DWB**—Advice to farmers for lessening the harmful effects of drought or excessive rainfall in dry and wet climates, level or sloping land, etc. Importance of methods of cultivation, of type of crops and irrigation practices are stressed. *Subject Headings:* **Drought amelioration, Soil conservation.**—*M.R.*

2.11–149 551.577.38:551.582:63(44)

Poli, C., **Observations climatologiques à Versailles.** [Climatological observations at Versailles.] *France, Institut National de la Recherche Agronomique, Trauvaux effectués en 1949 par les stations agronomiques*, **1950.** p. 1–2. **DWB**—Brief discussion of the mild and dry winter of 1948–49, the very dry spring and summer and the normally moist autumn of 1949. Temperatures, soil moisture deficit and other factors of interest to agronomy are mentioned. *Subject Headings:* **Climatology, Agronomy, Drought, Versailles, France.**—*M.R.*

2.11–150 551.578.11:551.508.85

Langille, R. C., **The scattering of ten-centimetre radio waves by rain.** *Journal of Geophysical Research*, 55(1):51–52, March **1950.** 2 refs. **MH-BH**—Distribution in a vertical plane of mass of free rainwater in a shower (in mg./m.^{3}) was found by plotting strength of waves back-scattered by a shower. Example shown. *Subject Headings:* **Microwave scattering, Radar analysis of rain.**—*C.E.P.B.*

2.11–151 551.578.7:551.509.34

Harrison, Henry T. and Beckwith, W. B., **Studies on the distribution and forecasting of hail in Western United States.** *American Meteorological Society, Bulletin*, 32(4):119–131, April **1951.** 2 tables, 13 diagrs., 13 refs. **MH-BH**—A report of the results of studies on the

distribution and frequency of hailstorms of all types and of the forecasting possibilities, which were carried out in Western United States during the 1949 hail season from May through Sept. A network of observing points was established in the Denver area in order to determine the ratio of area frequency to point frequency of hail; hail crop damage occurrence rates for every county in 15 states from New Mexico and Texas to the Canadian border and data on hail damage to aircraft were compiled and all weather maps for hail situations in the Denver area were analyzed synoptically. The geographical distribution of hail in the United States is discussed. The highest hail-thunderstorm rates in the United States occur over the western Great Plains and the east slope of the Rocky Mountains from the Rio Grande to the Canadian border. Point frequency of hail over the Western United States is not a valid criterion for determining relative area exposure to hail. The seasonal and diurnal variations of hail and the synoptic pattern for hail at Denver in 1949 are described. Hail at Denver is a post-cold frontal phenomenon but no method for forecasting damaging hail is available. Flight procedure for avoiding hail is discussed. *Subject Headings:* **Hailstorm frequency, Hailstorm distribution, Hail forecasting, Western United States.**—*I.L.D.*

HYDROMETEOROLOGY

2.11–152 551.579

Grahmann, Rudolf, **Witterung und Grundwasser im Bundesgebiet während des Abflussjahres 1949 und des Winters 1949/50.** [Weather conditions and ground water in the "Bund" area during the runoff year 1949 and the winter of 1949 and 1950.] *Das Gas- und Wasserfach*, 91(18), **1950.** 4 p. 2 figs. Reprint available. **DWB**—A summary of ground water conditions in northwestern Germany from Nov. 1948–April 1950, show that 1949 was a very dry year compared to the average for 1916–1945. The effect of precipitation variations on ensuing ground water levels is shown graphically. *Subject Headings:* **Ground water, Runoff, Germany.** —*M.R.*

2.11–153 551.579:060

Spengler, O. A., **Godovaia sessiia uchenogo Soveta Gosudarstvennogo Gidrologicheskogo Instituta.** [Annual session of the Learned Council of the State Hydrological Institute.] *Meteorologiia i Gidrologiia*, No. 3:80–83, **1947. DWB**—Report on the session which took place on January 23–25, 1947. Twelve papers about the work by the Institute in 1946 and a paper by Prof. Ogievskiĭ on the results of his research on the formation of runoff were presented. Some of the papers are summarized in the report. *Subject Headings:* **Conferences, Hydrological institutes, U.S.S.R.**—*C.K.*

2.11–154 551.579.5:550.837

Huber, A., **Über den Einfluss der Bodenfeuchtigkeit auf geoelektrischeTiefenmessungen.** [On the influence of soil moisture on geoelectric depth measurements.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(3–4):330–338, **1951.** 5 figs., equations, 5 refs. German, English and French summaries p. 330–331. **MH-BH** The theory of geoelectric depth measures based on the assumption that specific resistance of an individual stratum is constant and discontinuous with adjacent strata is not satisfactory in practice. Author prepared new reference curves assuming that, owing to gradient of soil moisture, specific resistance of upper layers follows an exponential law. *Subject Headings:* **Soil moisture, Geophysical prospecting.**—*C.E.P.B.*

2.11–155 551.579.5

Zawadil, Rudolf, **Schwankungen und Hochstände des Grundwassers im Wiener Raum (Vorläufige Mitteilung).** [Variations and highest levels of ground water in the Vienna area (Advance communication).] *Wetter und Leben*, 3(5–7):125–128, June **1951.** 2 figs. **MH-BH** —Most gages show a rising level, which in western Vienna is alarming. This is attributed to abandonment of wells for more distant sources. Short period fluctuations are due to variations of rainfall and of level of Danube. *Subject Headings:* **Ground water variations, Soil moisture, Vienna.**—*C.E.P.B.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

2.11–156 551.58

†Leighly, John, **Climatology since the year 1800.** *American Geophysical Union, Transactions*, 30(5):658–672, Oct. **1949.** 112 refs. **MH-BH**—Progress in the several fields of climatology is outlined in this paper. The work of the leaders in each field is mentioned briefly and critical remarks made on many aspects of their works. The empirical formulation of climatic data, descriptive climatology, climatic maps of the earth (general, pressure, wind, cloudiness and precipitation), synoptic climatology, the physical basis of climate, climatic regions and types, and climatic changes are considered separately and a valuable bibliography included. In the *discussion*, Leo Alpert mentions the omission of mention of C. E. P. Brooks' (1927) monthly mean maps of cloudiness for the earth, which have been used extensively in studies of the albedo of the earth and in studies of radiation and energy exchange over the earth. However, later (1945) charts by Landsberg are mentioned. *Subject Headings:* **Climatology, Progress in meteorology.**—*M.R.*

2.11–157 551.58:92

Maksimov, S., **Nikolaĭ Arkad'evich Korostelev.** *Meteorologiia i Gidrologiia*, No. 3:74–75, **1947. DWB**—A note in memory of the famous climatologist written for the fifth anniversary of his death (Jan. 10, 1942) 1871–1942. Worked on minimum temperature forecasting, microclimatology and climatology of health resorts. *Subject Headings:* **Biography, Climatology, Nikolaĭ Arkad'evich Korostelev.**—*C.K.*

2.11–158 551.582(47, 57)

Chefranov, S. V., **Geografiia SSSR.** [Geography of the U.S.S.R.] Moscow, UCHPEDGIZ, **1950.** 198 p. 97 figs. **DLC**—On pages 22 to 27 there is a brief general summary of the climatic characteristics of the U.S.S.R.: temperature, precipitation, etc. and more specific description of the climate of the Arctic, subtropical areas and the monsoon climate of the Far East. Three charts are included. Other sections treat of the soils, rivers, lakes and attempts at modifying nature. Then under each of 13 regional discussions there is a more detailed description of the climate of each. *Subject Headings:* **Climatology, U.S.S.R.**—*M.R.*

2.11–159 551.582(43)

*§Hagemann, Ernst and Voigts, Heinrich, **Bioklimatischer Atlas für Schleswig-Holstein.** [Bioclimatic atlas of Schleswig-Holstein.] Lübeck, Forschungsstelle für Landwirtschaftliche Planung und Landschaftsgestaltung, **1948.** 127 p. chiefly maps, diagr., tables. In portfolio. **DLC**—I. Large charts with colored isolines showing local variations in rainfall (monthly and annual), sunshine, cloudiness, relative humidity, temperature (monthly average, extreme and frequency values), frost, growing season, thunderstorms, snow cover, wind direction, speed and frequency of calms, rainfall frequency. II. Phenological charts. III. Probability of frost, etc. IV. General (large scale) climatic charts of usual elements. V. Agro-meteorological and VI bioclimatic evaluation. On back of charts is a great deal of information, much data, graphs and synoptic charts. *Subject Headings:* **Climatic data, Phenology, Atlases, Schleswig-Holstein, Germany.**—*M.R.*

2.11–160 551.582:629.13(664)

Great Britain. Meteorological Office, **Weather of the Sierra Leone Peninsula.** London, H. M. Stationery Office, **1946.** 15 p. 14 figs., map, tables. At head of title: M.O.M. 484. **DWB**—Discussion and representative statistics on various weather elements taken from observations made at Freetown since 1937 by the British West African Meteorological Service. A longer series of rainfall observations is supplemented by a map of the area (showing orography), cloud photographs of remarkable clarity, history of records, discussion and data of mean monthly temperature, humidity, vapor pressure, lapse rates (from airplane ascents), upper air temperatures and mixing ratios, surface and upper winds (Baille type wind roses), cloud height and frequency, thunderstorms, squalls, visibility and flying weather by months. *Subject Headings:* **Aeronautical climatology, Freetown, Sierra Leone, West Africa.**—*M.R.*

2.11–161 551.582(84)

*Stenz, Edward, **Condiciones climatológicas del altiplano de Bolivia.** [Climatological conditions of the Bolivian altiplano.] *Nimbus*, 2(6-7):3–23, April–Sept. **1950.** 12 tables, equations. **MH-BH**—Based on observations made by Dr. R. Kozlowski at the College of Mines at Oruro, Bolivia (18°S., 67°W., 3700 m. elevation) between 1916 and 1919, a systematic and analytical study was made in 1931 of the temperature, humidity, vapor pressure, precipitation, cloudiness, dust storms, wind, evaporation and other climatic characteristics. A comparison is made between climatic and vegetation conditions on the Altiplano and those in the free air or in the mountains of South America. The index of aridity (precipitation/evaporation) is given for a number of mountain or desert places in the world, showing Oruro to be about as arid as Amarillo, Texas. *Subject Headings:* **Climatology, Mountain meteorology, Bolivian Altiplano, Oruro, Bolivia.**—*M.R.*

2.11–162 551.582.2(784)

*Bavendick, Frank J., **Climate and weather in North Dakota.** Bismarck, North Dakota, State Water Conservation Commission, **1946.** 96 p. tables. **DWB**—Precipitation and temperature data over a period of 75 years have been summarized. Data on unusual and unfavorable weather conditions are presented in detail. *Subject Headings:* **Meteorological elements, Long period records, North Dakota.**—*I.L.D.*

2.11–163 551.582.2:551.506.3(669.91)

*Nosti, Jaime, **Climatología de los territorios Espanõles del Golfo de Guinea.** [Climatology of the Spanish territory of the Gulf of Guinea.] Madrid, Talleres Tipográficos Espasa-Calpe, **1942.** 67+p. 4 figs., diagrs., tables. **DLC**—Observations dating back to 1860 are used in this substantial treatise on the climate of the island of Fernando Po and the Spanish colony on the mainland, Rio Muni. The observations and equipment at the several stations are described in detail. Climatic zones, circulation of the air, pressure and wind, temperature, rainfall, agriculture and climate and the climate of this region compared with nearby regions in Africa are analyzed and discussed in separate chapters. Detailed tables and charts, wind roses, etc. supplement the text. *Subject Headings:* **Climatic data, Long period records, Fernando Poo, Spanish Guinea, Rio Muni, West Africa.**—*M.R.*

2.11–164 551.582.3

*Ravet, Jacques, **Atlas climatologique de Madagascar.** [Climatological atlas of Madagascar.] *Madagascar, Service Météorologique, Publication* No. 10, March **1948.** 95 p. all figs. **DWB**—Charts, showing isotherms of mean annual and mean monthly temperature, minimum and maximum temperature, mean annual and mean monthly relative humidity, annual and monthly isonephs, annual and monthly isohyets, wind roses and daily wind variations. *Subject Headings:* **Climatic data, Atlases, Madagascar.**—*I.L.D.*

MICROCLIMATOLOGY

2.11–165 551.584:551.511

*Gerhardt, J. R. and Jehn, K. H., **Further studies of the turbulent transfer of heat near the earth's surface.** *Texas, University, Electrical Engineering Research Laboratory, Report* No. 43, Nov. 30, **1950.** [n.p.] 29 figs., 7 tables, 7 refs. **DWB**—The eddy flux of heat is derived from micrometeorological data obtained at Manor, Texas on Aug. 3–4, 1948, Jan. 24–25, 1950 and Feb. 22–23, 1950 using theory presented by Lettau. Computations include radiation and heat transfer from air to soil and vice versa, from temperature and wind profiles based on detailed measurements. A comprehensive presentation and analysis of data. *Subject Headings:* **Micrometeorology, Eddy viscosity, Turbulence.**—*M.R.*

2.11–166 551.584:551.588.7(84)

Zabaleta, Julio, **La temperatura en la ciudad de Oruro.** [The temperature of the city of Oruro.] *Nimbus*, 2(6–7):41–56, April–Sept. **1950.** 17 figs., equations. **MH-BH**—A detailed analysis of wind, temperature, insolation and astronomical considerations which would affect the comfort of dwellings in Oruro, Bolivia (elev. 3700 m., lat. 18°S.). Schematic

diagrams and elaborate nomograms are presented to show the optimum orientation (45°) of dwellings or streets, and vegetation, to make the most of solar radiation for heating, etc. Number of calories received on various walls, at different times of day or season, are worked out on charts. Cooling conditions (radiative) are also considered as well as the climate of the patio. *Subject Headings:* **Urban climates, Architecture, Solar heating, Oruro, Bolivia.**—*M.R.*

2.11–167 551.584.2:551.506.8

Rosenkranz, Friedrich, **Das Phänoklima von Wien.** [The phenological climate of Vienna.] *Wetter und Leben*, 3(5–7):95–98, Jan **1951. MH-BH**—The marked relief of the neighborhood of Vienna causes differences of microclimate which are reflected in the vegetation. The differences in seasonal development in different suburbs are described. No data are available for center of town. *Subject Headings:* **Microclimatology, Topographic effects, Phenology, Vienna.**—*C.E.P.B.*

2.11–168 551.584.3

Lauscher, Friedrich, **Flachland- und Hügelklima im Gebiet von Wien.** [Plains and hill climate in the region of Vienna.] *Wetter und Leben*, 3(5–7):99–102, June **1951.** fig., 2 tables. **MH-BH**—Hohe Warte, Vienna (202.5 m.) is in a villa quarter, 4 km. N. of city center, on a ridge 40 m. above the Danube. Differences Aspern airfield in S.E. (156 m.)—Hohe Warte 1941–43 are tabulated monthly showing greater extremes of temperature, smaller rainfall and stronger winds at the former. The winds at Schwechat airfield in S.E. are more representative and are discussed in detail. *Subject Headings:* **Microclimatology, Topographic effects, Vienna.** —*C.E.P.B.*

2.11–169 551.584.31

Berg, Hellmut, **Kleinmeteorologische Messungen im Hohen Venn.** [Micrometeorological measurements in the High Venn.] *Zeitschrift für Meteorologie*, 5(7–8):229–235, July–Aug. **1951.** 6 figs., 3 refs. **MH-BH**—The Hohe Venn is a plateau 3 km. across and up to 660 m. high. Thermograms at Rötgen in a shallow valley on the north slope show a very frequent rise of temperature after sunset. Thermographs were exposed on the plateau and winds and temperatures explored in night trips. From these a generalized picture of the circulation is constructed showing pools of air cooled by radiation in the valleys to a temperature below that of air flowing down the slopes. *Subject Headings:* **Micrometeorology, Lee effects, Hohes Venn Mountains, Western Germany.**—*C.E.P.B.*

2.11–170 551.585(82)

Burgos, Juan Jacinto and Vidal, Arturo L., **Los climas de la República Argentina, según la nueva clasificación de Thornthwaite.** [The climates of the Argentina Republic according to Thornthwaite's new classification.] *Meteoros*, Buenos Aires, 1(1):3–32, Jan. **1951.** 8 figs., 6 tables, 29 refs. **DWB**—THORNTHWAITE's method of potential evapotranspiration is used to analyze the climate of Argentina, with particular reference to the relationship between vegetation and climatic zones, to describe the water balance and to classify the climate of Argentina. The precipitation and temperature data provided by the Argentine meteorological network have been used; actual measurement of evapotranspiration by means of "evapotranspiration tanks" has not been carried out. Maps showing water surplus, water deficiency, moisture regions, seasonal variations of moisture efficiency, thermal regions and the summer concentration of moisture efficiency are presented. A close correspondence in values for soil moisture was found between the results obtained by the THORNTHWAITE method and those obtained by actual calculations of soil moisture at several localities in Argentina. After analyzing the various methods of climatic classification applied to classify the Argentine climate the authors conclude that THORNTHWAITE's method shows the best correspondence with the vegetation zones. The article presents a complete description of method of potential evapotranspiration and the necessary data and nomograms for making calculations. *Subject Headings:* **Climatic classification, Evapotranspiration, Argentina.**—*I.L.D.*

BIOCLIMATOLOGY

2.11–171 551.586:06

Schulze, Rudolf, **Untersuchungen im Rahmen der hamburger medizin-meteorologischen Arbeiten (Strahlungsphysiologische Arbeiten in Wyk auf Föhr).** [Investigations in the

sphere of the Hamburg medical-meteorological works (Radiation physiological work in Wyk on Föhr).] *Wetter und Leben*, 3(5–7):81–85, June **1951.** table. **MH-BH**—A summary of investigations into relations between weather and man at the Biometeorological Institute of MANWD. Classified as: laboratory methods (experiments on individual subjects with simultaneous observations of, e.g. UV radiation); statistical (by biometeorograms based on data from Hamburg clinic); and dynamic (using daily weather charts and forecasts). *Subject Headings:* **Medical meteorology, Human ecology, Meteorological services.**—*C.E.P.B.*

2.11–172 551.586:136

Yamaguchi, S., **Influence of weather on mental state (I).** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(4):130–133, April **1951.** 3 figs., 4 tables, 3 refs. In Japanese, English summary p. (133). **MH-BH**—A statistical study of the fluctuations in the stock market prices for two Japanese corporations, as related to fluctuations in atmospheric pressure and polar fronts, led to elaborate formulas which, according to the author, showed that stock prices are influenced by atmospheric pressure and fronts. Data are given in tables and on graphs. *Subject Headings:* **Atmospheric pressure, Polar fronts, Psychology, Japan.**—*M.R.*

2.11–173 551.586:551.510.535

Menzel, Willi, **Terrestrische Wirkungen der Sonnenstrahlung.** [Terrestrial effect of solar radiation.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 5:77–80, **1951. MH-BH**—Discusses possible biological effect of disturbances of ionosphere due to UV, corpuscular and radio frequency solar radiation. *Subject Headings:* **Bioclimatology, Ionospheric disturbances, Solar radiation, Ultraviolet radiation.**—*C.E.P.B.*

2.11–174 551.586:546.296

Specht, W. und Rühlicke, K., **Bioklimatische Einflüsse (Aran) auf das Differentialblutbild gesunder und ultraschallbehandelter Individuen.** [Bioclimatic influences on the differential blood picture of healthy and electrically treated individuals.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 5:58–66, **1951.** 11 figs., refs. **MH-BH**—The effect of an oscillating current (1000 KHz, 3–4 w./cm.^{2}), applied to the arm, on blood economy showed similarities to the effect of changes of ozone content on healthy men and animals. *Subject Heading:* **Medical meteorology.**—*C.E.P.B.*

2.11–175 551.586:58(6)

de Backer, S. M., **L'influence du climat sur les êtres vivants. La météorologie en Afrique.** [Influence of climate on living organisms. Meteorology in Africa.] *Belgium, Institut Royal Météorologique, Miscellanées*, Fasc. 32, **1948.** 44 p. 9 figs., 15 refs., 2 equations. **MH-BH**—The section on the effect of climate upon living organisms deals in a very general way with the influence of climate upon growth and development of plants and of associations of plants, limiting temperatures of life and the role of temperature in accelerating mutation rate. The section on meteorology in Africa contains the following items, viz., tropical and intertropical climates in Africa, atmospheric circulation over Africa, winds aloft, displacement of the southwest monsoon in the Chad Basin, intertropical tornadoes, equatorial clouds, wind, storms, wind fogs, etc., geological evolution of climate and an uncritical and outmoded brief discussion of the effect of tropical climate upon living organisms. *Subject Headings:* **Bioclimatology, Tropical meteorology, Africa.**—*I.L.D.*

2.11–176 551.586:58/59

Yepes, Jose, **Definición de ambientes naturales en el altiplano.** [Definition of the natural conditions on the altiplano.] *Nimbus*, 2(6–7):24–31, April–Sept. **1950. MH-BH**—A description of the climatic, vegetative and zoological forms found in various "zones" of the high Bolivian plateau or surrounding mountains or plains. A number of Spanish geographical or ecological terms are defined. *Subject Headings:* **Climatic regions, Mountain meteorology, Ecology, Altiplano, Bolivia.**—*M.R.*

2.11–177 551.586:599.9:79

Hoxmark, Guillermo, **The International Olympic Games and the influence of climate on human energy.** *Ecology*, 32(1):151–153, Jan. **1951.** 3 tables. **DWB**—Using results of the

International Olympic Games as a measure of athletic prowess, the author concludes that the colder climates tend to develop individuals adapted for making violent physical exertion. *Subject Headings:* **Bioclimatology, Human activity.**—*G.C.B.*

2.11–178 551.586:612

Menzel, W., **Endogene Änderungen der Tagesrhytmik bei Gesunden und Kranken.** [Endogenous changes of the daily rhythm in healthy and sick persons.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 5:28–37, **1951.** 21 figs. **MH-BH**—Author studied daily rhythm of urine secretion and composition. The normal type shows a strong maximum in morning, minimum at night. Examples of change of amplitude and phase are shown for various diseases and with age, etc. These are analyzed and related to body temperature. *Subject Headings:* **Medical meteorology, Physiology.**—*C.E.P.B.*

2.11–179 551.586:63

Thornthwaite, Charles Warren, **Agricultural climatology at Seabrook Farms.** *Weatherwise*, 4(2):27–30, April **1951.** 3 figs. **MH-BH**—The work in agricultural climatology involves the study of the influence of climate on plant growth and development; the development of growth indices for crops, of a single index measuring growth and water use, the study of evapotranspiration and the perfection of instruments to measure air movement, vapor content of air and air temperature and the study of irrigation. *Subject Headings:* **Agricultural climatology, Seabrook, New Jersey.**—*I.L.D.*

2.11–180 551.586:631:551.578.46

Zykov, I. V., **Osobennosti snegotaianiia i znachenie lesnykh polos v sibirskoĭ lesostepi.** [Characteristics of snow thawing and the significance of forest strips in the Siberian forest steppe zone.] *Priroda*, Moscow, No. 4:54–57, **1951.** 2 figs., 4 refs. **DWB**—The significance of snow cover to winter crops and the characteristics and duration of the snow under forest steppe conditions are discussed. The role of wind in the thawing of snow in the Siberian steppe is considered and measures are suggested for preventing rapid thawing (evaporation) of snow under the action of wind by the use of forest strips. *Subject Headings:* **Agricultural meteorology, Snow cover, Steppes, Siberia.**—*I.L.D.*

UPPER AIR AND APPLIED CLIMATOLOGY

2.11–181 551.587

Gray, R. and Carruthers, N., **Upper air over the Falkland Islands.** *Meteorological Magazine*, London, 80(947):125–130, May **1951.** 4 figs., 2 tables, 2 refs. **MH-BH**—From radiosondes at Port Stanley, Feb. 1948–May 1950, diagrams of seasonal frequencies of temperature 900–100 mb. with means for Jan. and July and extremes are constructed. Wind roses are given up to 150 mb. and frequencies of pressure at tropopause. The mean pressure is 254 mb. and temperature −70°F. *Subject Headings:* **Upper air data, Meteorological elements, Falkland Islands.**—*C.E.P.B.*

2.11–182 551.588.1

Bonacina, L. C. W., **Geographical differentiation and the genesis of weather types.** *Weather*, 6(3):79–80, March **1951.** **DWB**—Geographical features of earth's surface can override the planetary circulation but their effect depends on the global situation existing at the time. *Subject Headings:* **Continentality, General circulation, Weather types.**—*C.E.P.B.*

2.11–183 551.588.7

†Steinhauser, Ferdinand, **Ergebnisse und Aufgaben stadtklimatischer Untersuchungen in Wien.** [Results and exercises of urban climatological investigations in Vienna.] *Wetter und Leben*, 3(5–7):86–94, June **1951.** 20 refs. **MH-BH**—Aims of urban climatology are town planning and effect of towns on well being and health. This general article discusses composition and ion content of Vienna air, weakening of radiation, effect of town on temperature, and relation of air currents to purity of air and to precipitation. *Subject Headings:* **Urban climates, Vienna.**—*C.E.P.B.*

2.11–184 551.588.2

Bonacina, L. C. W., **The scenery of Devonshire in relation to the weather and climate.** *Weather*, 6(5):131–135, May **1951. DWB** –General account of sheltered climate of valleys, severity of Dartmoor, storms carrying salt inland, frost and snow. *Subject Headings:* **Climatology, Topographic effects, Devonshire, England.**—*C.E.P.B.*

MISCELLANEOUS APPLICATIONS

OPTICAL PHENOMENA

2.11–185 551.593.11

ten Kate, H., **Luchtspiegelingen.** [Mirages.] *Hemel en Dampkring*, 49(5):91–94, **1951.** 9 figs. **DLC** —A clearly written and illustrated article on the various types of mirages observed under varying conditions of atmospheric stability or instability. The numerous forms are classified under two general types: 1) those which occur with abnormally great stability or 2) with abnormal instability. *Subject Headings:* **Mirages, Atmospheric refraction.**—*M.R.*

2.11–186 551.593.62

Myhura, H. and Grinsted, W. A., **Unusual rainbow phenomena.** *Weather*, 6(7):219, July **1951.** fig. **DWB**—Extra bow formed by sun's reflection from water; unusual rainbows in Uganda. *Subject Headings:* **Rainbows, Uganda, East Africa.**—*C.E.P.B.*

2.11–187 551.593.5

Malsch, Wolfgang, **Einige Beobachtungen der hochatmosphärischen Störung Ende September 1950.** [Some observations of the upper atmospheric disturbance at the end of Sept. 1950.] *Meteorologische Rundschau*, 4(5-6):110, May-June **1951. MH-BH** —Remarks on blue sun and Bishop's ring observed in Germany Sept. 28–30, 1950. *Subject Headings:* **Blue sun, Bishop's ring, Smoke pall—Sept. 1950, Upper atmosphere, Germany.** –*C.E.P.B.*

2.11–188 551.593.54

Bull, G. A., **Blue sun and moon.** *Marine Observer*, 21(153):167–169, July **1951. DWB**—Summary of observations over Great Britain (including reports from aircraft) and W. Europe Sept. 26–30, 1950 and brief discussion of cause. *Subject Headings:* **Blue sun, Blue moon, Smoke pall—Sept. 1950, Western Europe.**—*C.E.P.B.*

2.11–189 551.593.63

Smiley, Charles H., **Atmospheric refraction at low altitudes.** *Royal Meteorological Society, Canadian Branch, [Publications]*, 1(7), Oct. **1950.** 9 p. table, 11 refs. Mimeographed. **DWB**—Resumé of approximately 35,000 observations of the vertical diameter of the sun at low altitudes taken in Rhode Island (1946), Brazil (1947), Antarctic (1947–48), Arctic (1949), Alaska and the West Coast of the United States (1949), across the North Pole (1949) and on Mt. Washington (1950). The following sources of error in the observations are examined: index correction of the sextant and variation in it, the backlash, the personal equation of the observer and its variation, and the Polaroid filters. Author concludes that it is not feasible to base a new theory of atmospheric refraction on the data now available because the polar regions are not sufficiently represented. The table gives comparable values of refraction corrections for the tropics from BESSEL's tables, WILLIS' tables, GARFINKEL's theory and the author's integrations. *Subject Heading:* **Atmospheric refraction.**—*M.L.R.*

AURORAS

2.11–190 551.594.5:551.521.64

Gerson, N. C., **Correlation of auroras with increased cosmic ray intensities (November 19, 1949).** *Nature*, London, 167(4257):894–895, June 2, **1951.** table, 9 refs. **DWB**—A solar flare of importance 3 was observed 10.29–11.19 G.M.T., associated with considerable (up to 200%) increase of cosmic ray activity, ionospheric disturbance and many records of aurora, both Northern and Southern Hemispheres. *Subject Headings:* **Auroras, Cosmic radiation, Solar flares, Northern Hemisphere, Southern Hemisphere.** *C.E.P.B.*

2.11–191 551.594.5

Ol', A. I., **Poliarnoe siianie 19–21 avgusta 1950 g.** [Aurora borealis on Aug. 19–21, 1950.] *Priroda*, Moscow, No. 4:59–61, 1951. 4 refs. **DLC**—A detailed description based upon reports of observers in various parts of the U.S.S.R. supplemented by observations made in western Europe is presented. The accompanying magnetic and solar phenomena are discussed. *Subject Headings:* **Auroras, U.S.S.R., Western Europe.**—*I.L.D.*

2.11–192 551.594.51:550.385

Alfvén, H. and Martyn, D. F., **The theory of magnetic storms and auroras.** *Nature*, London, 167 (4259):984–985, June 16, **1951.** 6 refs. **DLC**—Alfvén stresses the need for experiments such as Birkeland's to check geophysical theories. Martyn, in reply, refers to work of Chapman and Ferraro. *Subject Headings:* **Auroras, Magnetic storms.**—*C.E.P.B.*

2.11–193 551.594.51:550.385

Chapman, Sydney, **The theory of magnetic storms and auroras.** *Nature*, London, 168(4263):86, July 14, **1951.** 5 refs. **DLC**—Referring to the theory by H. Alfvén, *Nature*, June 16, author discusses the difficulties of verifying theories, both experimentally and theoretically. *Subject Headings:* **Auroras, Magnetic storms.**—*C.E.P.B.*

OCEAN CURRENTS

2.11–194 551.46:532.59

Yoshida, Kozo, **On the ocean wave spectrum with special reference to the beat phenomena and the "1–3 minute wave."** *Tokyo University, Geophysical Institute, Geophysical Notes*, 3(39), **1950.** 8 p. 5 figs., 4 tables, 6 refs., 31 equations. **DWB**—Author suggests that wave beats of 1–3 minutes period, instead of being due to two separate wave trains of nearly equal period, are due to a single series of waves having either a continuous spectrum in which maximum energy is concentrated in a narrow belt of 1–2 seconds width, or with discrete peaks. The periods of beats in such cases are analyzed. *Subject Headings:* **Wind waves, Surf.**—*C.E.P.B.*

2.11–195 551.465:532.5

Craya, A., **Critical regimes of flows with density stratification.** *Tellus*, 3(1): 28–42, Feb. **1951.** 5 figs., 2 refs., 15 equations. **MH-BH**—In the case of fluid flow in an enclosed channel, a critical regime is dependent on a certain velocity-density relationship, as for example when a sudden drop occurs in the channel (vertical freedom of movement). The analogy between such currents and those in or on the surface of a large body of water is incomplete since in the latter case there is freedom of movement horizontally as well as vertically. The mathematical principles of the various cases (submerged and surface gravity currents both homogeneous and stratified) are worked out in detail and profiles drawn. *Subject Headings:* **Ocean currents, Hydrodynamics.**—*M.R.*

2.11–196 551.465

§Fuglister, F. C. and Worthington, L. V., **Some results of a multiple ship survey of the Gulf Stream.** *Tellus*, 3(1):1–14, Feb. **1951.** 11 figs., 5 refs. **MH-BH**—Between June 6 and 23, 1950, a comprehensive program of oceanographic research was conducted by the U. S. Hydrographic Office in the Gulf Stream area, using 6 ships. The ships were in constant communication with each other, and synoptic charts of oceanic conditions were drawn to determine the boundaries, strength, eddies, temperature, salinity, etc. of this remarkable stream. For the first time eddies were charted in detail and the abruptness of the boundary determined. Great success was partly due to Loran observations enabling exact positions, depths, etc. to be ascertained. Paths of ships and other features are shown in charts and graphs. *Subject Headings:* **Gulf Stream, Oceanographic surveys, North Atlantic.**—*M.R.*

2.11–197 551.465

Hidaka, Koji, **Drift currents in an enclosed ocean. Part I.** *Tokyo University, Geophysical Institute, Geophysical Notes*, 3(23), **1950.** 23 p. 15 figs., 2 tables, 8 refs., 42 equations. **Part II.** *Ibid.*, 3(38), **1950.** 10 p. 3 refs., 42 equations. In English. **MH-BH**—The mean

transport method of discussing wind-driven ocean currents does not give the vertical structure. In Pt. I author tries to remedy this defect by including vertical mixing. His equations are applied to a rectangular ocean comparable with N. Pacific, first infinitely deep and then of limited depth. In Pt. II causes of disagreement with results of MUNK and H. STOMMEL are considered and a method is given for solving equations of mass transport on a rotating globe. *Subject Heading:* **Ocean currents.**—*C.E.P.B.*

2.11–198 551.465:550.345:550.345

Ogiwara, S. and Ôkita, T., **Studies on Tsunami on the Pacific coasts of Northern Honshu.** [The model experiment of Tsunami in Shizukawa harbour.] *Meteorological Society of Japan, Journal*, 2nd *Ser.*, 28(9):346–352, Sept. **1950.** 10 figs., 3 refs., equation. In Japanese, English summary p. 351–352. **MH-BH**—A model of Shizukawa Bay was placed in a tank and behavior of artificial waves studied. Model breakwaters were then added to find best way to protect town at head of bay. *Subject Headings:* **Seismic sea waves, Honshu, Japan.**—*C.E.P.B.*

2.11–199 551.465:551.511

Stommel, Henry, **An elementary explanation of why ocean currents are strongest in the west.** *American Meteorological Society, Bulletin*, 32(1):21–23, Jan. **1951.** 2 figs., 2 tables, 4 refs. **MH-BH**—By means of schematic diagrams, the author presents a nonmathematical explanation of the reason for the strong ocean currents on the western edges of the Atlantic and Pacific and the relatively weak currents on the eastern sides. The cause is attributed to the unbalance between wind stress, frictional and planetary vorticity in asymmetric circulation compared to symmetric circulations. *Subject Headings:* **Ocean currents, Vorticity.**—*M.R.*

2.11–200 551.465

Stommel, Henry, **Determination of the lateral eddy diffusivity in the climatological mean Gulf Stream.** *Tellus*, 3(1):43, Feb. **1951.** table, 2 refs. **MH-BH**—Computations of lateral eddy diffusivity from Gulf Stream data obtained by FUGLISTER and WORTHINGTON (*see item* 2.11–196 above) are given for mean conditions and seem to indicate the very thin filament-like nature of individual eddies may be due to other causes. *Subject Headings:* **Eddy diffusion, Gulf Stream.**—*M.R.*

PART II. SELECTIVE ANNOTATED BIBLIOGRAPHY ON MOUNTAIN METEOROLOGY

By: *Charles Ernest Pelham Brooks*

EXPLANATORY NOTE

In selecting material for a bibliography on Mountain Meteorology, it was necessary to restrict the field to papers which dealt with the physical rather than the physiological factors. The latter subject will comprise an entire and separate bibliography. However, as can be seen from the following outline, a few papers have been included on almost every subject which might come under the general headings of (a) effects of elevations on meteorological elements and (b) effects of mountain conditions on observations, instruments and observatories.

Since a separate bibliography on special winds was published in the July 1951 issue of Meteorological Abstracts and Bibliography, very little material on mountain and valley winds, Föhn winds, etc. has been included in this number.

Moreover, the definition of "mountains" has as a rule been restricted to what is generally known as High Mountains, or the equivalent of the German *Mittelgebirge* and *Hochgebirge*, since the number of papers from which to select would be increased from about 2000 to 10,000 if all elevations of land were considered as mountains. Also the emphasis has been placed on recent papers, although the preponderance of papers on mountain meteorology were written during the last half of the 19th century, when in the absence of effective sounding devices for studying the upper air, mountain observatories were being established in all parts of the earth, and quantitative results from the latter were first becoming available for analysis. The development of the PIBAL, APOB and RAOB techniques in the 20th century shifted the emphasis to the study of the free atmosphere and rendered the mountain observatories seemingly obsolete. Now with studies of micro- and mesoclimatology and orographic effects becoming increasingly popular, mountain observatories are again becoming prominent.

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1787

2K–1 551.5(234.3)

*de Saussure, Horace-Bénedict, **Voyages dans les Alpes, précédés d'un essai sur l'histoire naturelle des environs de Genève.** [Travels through the Alps, preceded by an essay on the natural history of the surrounding area of Geneva.] Geneva, Barde, Manget and Co., **1787–1796.** 8 Vols. plates, tables. **DLC.** German ed. **Reisen durch die Alpen.** Leipzig, **1788. DLC.**—The author of this fascinating series of essays on travels and natural history of the Alps region, not only developed the hair hygrometer and wrote a classic treatise on its use, but took many careful observations at regular intervals (usually bi-hourly) on his several journeys and ascents of Mont Blanc. These observations are summarized in seven separate chapters in Vol. 7 (1796), p. 303–347 and 387–501, wherein the conditions of atmospheric pressure, temperature in the sun and shade, humidity, evaporation, cloud conditions, snow, hail, wind, thunderstorms, atmospheric electricity, auroras, transparency of the air, water and air content of snow, zenith sky brightness and color of sky, chemical composition of the air, etc. during the ascents of Mt. Blanc and the Col du Géant are described and tabulated. Many other chapters contain material of meteorological interest based on observations in the mountains. For instance, in Vol. 4, Chap. 35 (p. 110–148) contains a summary of the theories of Lambert, De Luc, Bouguer, Pictet and the author on the cause of cold in mountains and on inversions of temperature. The following chapter (p. 148–162) discusses observations on the height of the snow line in the Alps, Pyrenees, Mt. Etna and the Andes of Peru. The carefully reported observations are well-supported by tabular summaries of quantitative data or frequencies of phenomena reported. *Subject Headings:* **Mountain meteorology, Climatic data, Alps.**—*M.R.*

1854

2K–2 551.582(515)

Strachey, Henry, **Physical geography of Western Tibet.** London, William Clowes, **1854.** 69 p. fold. map. **DLC**—Besides detailed descriptions of mountains, valleys, rivers, glaciers, floods and elevations, the author, who spent two years (1847–1849) in the upper valleys of the Himalayas, gives remarkably vivid and detailed data on the climate (p. 58–69). Data for Leh (12,000 ft.) include air temperature, frost, earth temperature, sun temperature, ice, barometric pressure, winds, clouds, rainfall, snow, snow line, atmospheric electricity and thunderstorms. At 12,000 ft. freezing occurs every night during the winter, but in summer maxima near 70°F. occur in the daytime and summer frost is not frequent below 15,000 ft. and some thawing occurs in July and August up to 20,000 ft. Air is clear and dry in winter, and temperatures in the sun of 145° were recorded when the shade temperature was near freezing. At 14,000 ft. or higher temperature in the sun exceeded 100°F. most of the time. *Subject Headings:* **Mountain meteorology, Physiography, Tibet, Indus Valley.**—*M.R.*

1859

2K–3 551.506.5(749.1)

Smyth, C. Piazzi, **Astronomical experiments on the Peak of Teneriffe, carried out under the sanction of the Lords Commissioners of the Admiralty.** *Royal Society of London, Philosophical Transactions,* Vol. 148, Pt. 2:465–533, **1859. DSI**—A complete record of observations of temperature, humidity, pressure etc. in July through September 1856. *Subject Headings:* **Mountain meteorology, Expeditionary climatic data, Tenerife, Canary Islands.**

1873

2K–4 551.506.3(237)

Howgate, H. W. and Sackett, D. H., **Report of meteorological observations made at Mount Mitchell during the months of May, June, July, August and part of September, 1873.** *U. S. Army, Signal Corps, Annual Report, Paper* No. 16:770–947, **1873. DLC**—Hourly observations on summit of Mt. Mitchell, North Carolina, height of barometer 6691 ft. with abstract of daily journal. Comparative observations included at base (2560 ft.) and Knoxville, Tenn. (993 ft.) *Subject Headings:* **Mountain meteorology, Expeditionary climatic data, Mountain observatories, Mount Mitchell, North Carolina.**

1879

2K–5 551.577.51(235)

Hill, S. A., **Die Höhe der Maximalzone des Regenfalles im Nordwest-Himalaya und ihre physikalische Begründung.** [The height of the maximum zone of rainfall in the north-west Himalayas and its physical basis.] *Österreiche Gesellschaft für Meteorologie, Zeitschrift,* 14:161–165, May–July

1879. tables. **DGS**—Gives rainfall amounts (inches) up to 10,600 ft. and ratio R to amount at sea level. R is given by $1+1.92\ h-0.40\ h^2+0.02\ h^3$ where h is height in thousands of feet. Maximum R 4.29 at 3420 ft., minimum 0.12 at 10,600 ft. Discussed in relation to variation of vapor pressure with height. *Subject Headings:* **Mountain meteorology, Rainfall, Himalayas.**

2K–6 551.554:551.515.127(742)

Loomis, Elias, **Contributions to meteorology, being results derived from an examination of the observations of the U. S. Signal Service, and from other sources. The winds on Mt. Washington compared with the winds near the level of the sea.** *American Journal of Science*, 3rd Ser., 18(103):1–16, July 1879. **DLC**—In most cyclonic depressions over New England, the system of circulating winds does not extend to a height of 6000 ft., the height depending on the depth of the depression. When it does reach the summit, the change to the east begins at the surface 11 hours earlier than at the summit, and the change to west 5 hours earlier. *Subject Headings:* **Mountain meteorology, Depressions, Mount Washington, New Hampshire.**

2K–7 551.58(749.1)

Marcet, W., **Meteorological observations on the Peak of Teneriffe.** *Royal Meteorological Society, Quarterly Journal*, 5:227–236, 1879. 2 tables. **MH-BH**—A general description of the weather and a few observations of temperature, humidity and wind in June–July 1878. Includes a discussion of the physiological and electrical effects of dry air. *Subject Headings:* **Mountain meteorology, Tenerife, Canary Islands.**

2K–8 551.506.5(235)

Scully, J. and Blanford, H. F., **Meteorological and hypsometrical observations in Western Tibet, recorded by Dr. J. Scully with a discussion by H. F. Blanford.** *India, Meteorological Dept. Memoirs*, 1(3):213–248, 1879. numerous tables, fold. plate. **DLC**—Observations carefully recorded on a journey from Yarkand to Sind Valley across Karakorum Plateau at heights up to 17,786 ft., including some hourly observations of temperature, pressure and humidity; a black-bulb in vacuo was also carried. The discussion gives much information about vertical variation of temperature and humidity. *Subject Headings:* **Mountain meteorology, Expeditionary climatic data, Tibet.**

1882

2K–9 551.582(235)

Atkinson, Edwin T., **Himalayan districts of the North-Western Provinces of India.** Allahabad, 1882. **DLC**—Chapter V, Meteorology, by S. A. Hill (58 p.) contains: Preliminary sketch of climate. Contrast between the eastern and western parts of the plain and the Himalayas. Radiation, solar and nocturnal. Temperature, diurnal and annual ranges, vertical decrement, height of snow line. Pressure and winds: barometric tides, mountain winds, annual variation of pressure, monsoons. Humidity: vertical distribution of vapor, relative humidity, cloud. Rainfall: distribution on plains and on the Himalayan slope, annual variation, the winter rains, and the monsoon rains. *Subject Headings:* **Mountain meteorology, Himalayas, India.**

2K–10 551.543.5(237)

Hazen, H. A., **On the retardation of the maxima and minima of air-pressure at high stations.** *U. S. Army Signal Corps, Annual Report*, Vol. 4, Pt. 1, Append. 73:897 926, 1882–1883. 2 figs. 3 tables+25 tables of hourly obs. **DLC**—Concludes that apparent retardation in fluctuations at summits is due to temperature effects, sluggishness of summit barometers and effect of closed room. Tables give hourly pressures and temperatures at summit and base of Mt. Washington, May 1872 and May–June 1873 and at Colorado Springs and Pike's Peak Aug.–Sept. 1874. *Subject Headings:* **Mountain meteorology, Pressure variations, Colorado Springs, Pike's Peak, Colorado.**

1884

2K–11 551.508.21 551.521.12

Langley, S. P., **Researches on solar heat and its absorption by the earth's atmosphere. A report on the Mount Whitney Expedition.** *U. S. Signal Service, Professional Papers*, No. 15, 1884. 242 p. 20 figs., 21 plates, numerous tables. **DWB.** See also: *Science*, 5:441–450, 1885. **DLC**—After preliminary observations on selective absorption of solar radiation at Allegheny in 1880 and 1881, an expedition was made to summit of Mt. Whitney (14–15,000 ft.) in July–Sept. 1881. After a historical introduction there follows an account of the instrumental set up, observations and the classical determination of the solar energy curve. The solar constant was calculated as 3 cal./cm²/min. *Subject Headings:* **Mountain meteorology, Solar constant, Mount Whitney, California.**

1886

2K–12 551.501.9:551.43

Rotch, A. Lawrence, **The mountain meteorological stations of Europe.** *American Meteorological Journal*, 3:15–24, **1886. MH-BH**—Descriptive article dealing only with Ben Nevis, Scotland and Fort William. *Subject Headings:* **Mountain observatories, Ben Nevis, Fort William, Scotland.**

2K–13 551.506.1(234.3)

Sonnblick-Verein, **Jahresberichte,** Nos. 1–46. Vienna, **1886–1937. MH-BH**—This more or less annual report includes annual summaries of regular observations on Sonnblick (3106 meters), Obir (2044 m.), Zugspitze (2962 m.), Säntis (2500 m.), Dollach (1004 m.) and Rauris (946 m.), besides numerous memoirs on mountain meteorology in various parts of the world. A few of the more important of the memoirs are noted separately. *Subject Headings:* **Mountain meteorology, Yearbooks, Alps.**

1888

2K–14 551.582:551.43(749.1) 551.594.11

Abercromby, Ralph, **Electrical and meteorological observations on the Peak of Teneriffe.** *Royal Meteorological Society, Quarterly Journal*, 14(66):101–106, April **1888. MH-BH**—Observations of electric potential from 50 to 12,200 ft. in Oct. 1887 all showed a positive gradient averaging, at the summit, 549 volts between 5 ft. 5 ins. and the ground. Article also describes clouds, frequency of halos, shadow of the peak and vertical succession of winds. *Subject Headings:* **Mountain meteorology, Atmospheric electricity, Tenerife, Canary Islands.**

1889

2K–15 551.506.3(237)

*U. S. Signal Service, **Meteorological observations made on the summit of Pike's Peak, Colorado, latitude, 38°50′N., longitude, 105°2′W., height 14,134 feet, January 1874 to June, 1888.** *Harvard University, Astronomical Observatory, Annals*, 22, **1889.** 475 p. **DLC**—This volume consists mainly of full observations at Pike's Peak, six times daily, but with hourly observations in Aug. and Sept. 1874 and hourly wind speed 1874–75. The observations of pressure, temperature and precipitation are summarized in months and there is a full weather journal. *Subject Headings:* **Mountain meteorology, Observational data, Pike's Peak, Colorado.**

1890

2K–16 551.524.4(237)

Hazen, H. A., **Observations and studies on Mt. Washington.** *American Meteorological Journal*, 7:393–398, **1890.** tables. **MH-BH**—Discusses vertical distribution of temperature on various descents and ascents. Results tabulated in feet per degree for dry and wet air. *Subject Headings:* **Mountain meteorology, Vertical temperature gradient, Mount Washington, New Hampshire.**

1891

2K–17 551.506.2:551.43(52)

Masato, H.; Kondo, H. and Kono, T., **Meteorological observations on the summit of Mount Ontake.** *Japan, Central Meteorological Observatory, Report* No. 2, **1891.** 20 p. tables. **DWB**—Summarizes and discusses 2-hourly observations Aug. 1–Sept. 12, 1891, at foot and on summit of Mt. Ontake (35°53′N., 137°28′E., 3069 m.) of pressure, temperature, humidity, wind speed, cloud, and 4-hourly measurements of rain. Two storms were experienced. *Subject Headings:* **Mountain meteorology, Expeditionary climatic data, Japan.**

2K–18 551.506(411) 551.501.9(411)

*Scottish Meteorological Society, **Journal.** Vols. 7–11. London, William Blackwood, **1891–1898. MH-BH**—The *Journal* includes a number of papers on various aspects of the meteorology of Ben Nevis. Among these are: *Annual reports*, Ser. 3, 7:4–27, 153–162, 296–303, 1891; subsequently annually in *Reports from the Council* up to 1898, the last dealing with the closing of the Observatory; A. RANKIN, "St. Elmo's fire on Ben Nevis." 8:191–200, 1892; R. T. ORMOND, "Daily mean temperatures at Ben Nevis Observatory and Fort William." 9:27–32, 1893; R. C. MOSSMAN, "Thunderstorms at Ben Nevis Observatory." 9:33–38, 1893; R. C. MOSSMAN, "Silver thaw at the Ben Nevis Observatory." 9:115–124, 1893; A. RANKIN, "Preliminary notes on observations of dust particles at Ben Nevis Observatory." 9:125–132, 1893; A. BUCHAN, "The influence of high winds on the barometer at the Ben Nevis Observatory." 9:132–137, 1893; A. BUCHAN, "Certain relations of pressure and temperature at the Ben Nevis Observatories." 9:137–140, 1893; A. J. HERBERTSON, "Hygrometric researches at the Ben Nevis Observatory." 10:41–49, 1894; R. T.

ORMOND, "Change of temperature with height during anticyclones on Ben Nevis and at some continental stations." 11:65–71, 1898; R. C. MOSSMAN, "Further results of Mr. Wragg's Ben Nevis observations, taken in the year 1882. Humidity and temperature variability." 11:284–289, 1898. (Complete review of the history of this journal appears in *item 2–3, Feb. 1950 Meteorological Abstracts.*) *Subject Headings:* **Mountain meteorology, Climatic data, Ben Nevis, Scotland.**

1892

2K–19 551.501.9:551.43

Rotch, A. Lawrence, **The mountain meteorological stations of the United States.** *American Meteorological Journal*, 8:396–405, **1892.** 5 photos. **MH-BH**—Accounts, some with photos, of establishment of Mt. Washington (6280 ft.), Green Mountain (1541 ft.), Blue Hill (640 ft.), Mount Mitchell (6700 ft.), Pike's Peak (14,134 ft.), Mt. Hamilton (4300 ft.), Mt. Whitney (11,600 ft.) *Subject Headings:* **Mountain observatories, United States.**

1893

2K–20 551.582(788)

Williams, C. Theodore, **The high altitudes of Colorado & their climates.** *Royal Meteorological Society, Quarterly Journal*, 19(86):65–82, April **1893.** 2 figs., 2 tables. **MH-BH**—A general description of the geography of Colorado and climate of the various zones. Climate of snow peaks of 12,000–14,000 ft. is represented by Pike's Peak, including quotations on electrical effects. Lower levels are suitable for health resorts. *Subject Headings:* **Mountain meteorology, Pike's Peak, Colorado.**

1894

2K–21 551.577.51

Curtis, G. E., **The effect of wind currents on rainfall.** *U. S. Signal Service, Notes*, No. 16, Pt. 2, **1894.** 11 p. 3 figs., 3 tables. **DWB**—Discusses previous work on effect of wind on catch of a raingage, and effect of topography on true rainfall. Then examines comparative observations with 5 raingages on summit of Mount Washington, classified according to wind direction as windward, central and leeward. Results discussed in terms of wind speed and gage diameter. *Subject Headings:* **Mountain meteorology, Rainfall distribution, Mount Washington, New Hampshire.**

1895

2K–22 551.5:551.43(236)

Elliot, G. F. Scott, **Expedition to Ruwenzori and Tanganyika.** *Geographical Journal*, London, 6(4):301–324, Oct. **1895. DWB**—A brief description of climate and diurnal variation of cloud in an ascent to 13,000 ft. This is quoted in *Royal Meteorological Society, Quarterly Journal*, 22(99):233–234, July 1896. *Subject Headings:* **Mountain meteorology, Ruwenzori, Uganda, Tanganyika.**

1896

2K–23 551.501.9

Inwards, Richard, **Meteorological observatories.** *Royal Meteorological Society, Quarterly Journal*, 22(98):81–98, April **1896.** 3 figs. **MH-BH**—Includes p. 92–96 descriptions of Mont Blanc Observatory and brief references to El Misti (Peru) and Pike's Peak. *Subject Headings:* **Mountain meteorology, Mountain observatories, Mont Blanc Observatory, France.**

2K–24 551.582(234.3)

Morgan, T. H., **Mont Blanc Observatory.** *Royal Meteorological Society, Quarterly Journal*, 22(100):297–298, Oct. **1896. MH-BH**—Brief summary of results of M. Janssen's observatory. Diurnal variation of pressure large, of temperature small. Maximum humidity 18 h. in summer. Wind very gusty in storms. *Subject Headings:* **Mountain meteorology, Mountain observatories, Mont Blanc, France.**

1904

2K–25 551.524.4(234.3)

de Quervain, A., **Die Hebung der atmosphärischen Isothermen in den Schweizer Alpen und ihre Beziehung zu deren Höhengrenzen.** [The elevation of the atmospheric isotherms in the Swiss Alps and their relations to the height limits.] *Beiträge zur Geophysik*, 6:481–533, **1904.** 14 charts, 2 plates. **DWB**—For various regions, heights of tree-line and snow-line are set out and factors determining them are discussed. The thermal influence of mass elevation is considered, with comparison of mountain and free air observations. Problems of constructing reduced isotherms are

examined and monthly mean temperatures at 7, 13 and 21 h. at mountain stations tabulated. Positions of isothermal surfaces are discussed month by month at different times of day. Charts show monthly isotherms at 1500 m. at 7 h. and 13 h. with mean elevation, tree-line and snow-line for comparison. *Subject Headings:* **Mountain meteorology, Temperature, Swiss Alps.**

1905

2K–26 551.577.3(411)

Watt, A., **The rainfall of the Ben Nevis observatories.** *Scottish Meteorological Society, Journal,* 3rd Ser., 13:15–32, **1905.** 3 figs., 12 tables. **MH-BH**—Compares monthly and hourly rainfall on Ben Nevis (4405 ft.) and at Fort William (31 ft.). On Ben Nevis the annual average (1891–1903) was 170.77 in., maximum intensity noon–6 p.m. At Fort William mean was 79.96 in., maximum 2–6 a.m. but amplitude only 10–13%. *Subject Headings:* **Mountain meteorology, Rainfall variations, Ben Nevis, Fort William, Scotland.**

1906

2K–27 551.501.9:551.43

Church, J. E., Jr., **The Mount Rose weather observatory.** *Monthly Weather Review,* 34:255–263, **1906.** 9 figs. **DWB**—Account of erection of instrument shelter on Mount Rose, Nevada (10,800 ft.), with extremes of temperature and specimen thermogram and barogram at peak and base. The object is to forecast frosts on adjacent fruit growing lowlands. J. E. CHURCH gave an account of "Electric disturbances and perils on mountain tops" (*Monthly Weather Review,* 35:578–579, 1907) from observations on Mt. Rose. *Subject Headings:* **Mountain observatories, Atmospheric electricity, Mount Rose, Nevada.**

2K–28 551.515.8(234.3)

von Ficker, Heinz, **Der Transport kalter Luftmassen über die Zentralalpen.** [The transport of cold air masses across the Central Alps.] *Vienna, (K.) Akademie der Wissenschaften, Math.-Naturwiss. Klasse, Denkschriften,* 80:131–200, **1906.** 33 figs., tables. **DSI**—Great falls of temperature on Sonnblick, 1901–1903, all occurred with N. winds in the rear of a depression. The cold air first spreads in the lowest levels of the northern valleys; cooling at the summit often does not begin for 12 hours. Cold air reaches Säntis first, then Zugspitze and finally Sonnblick; during this period there are great horizontal differences of temperature. The subsequent warming begins at the summits and slowly penetrates the valleys. On the south side cooling begins later than on summits and is generally less intense. The Alps are an extraordinarily important line of meteorological demarcation. *Subject Headings:* **Mountain meteorology, Cold waves, Alps.**

1908

2K–29 551.5:551.43

Mount Weather Observatory, **Bulletin.** Vols. 1–6, **1908–1914. DWB**—Among the numerous articles in this periodical many deal with various aspects of mountain meteorology. There are also daily summaries of the weather (1725 ft.), and results of kite flights. Vol. 1, p. 7–11, includes a paper: "The origin and purpose of the Mount Weather Observatory," by WILLIS R. MOORE. Vol. 6 includes a general index to the 6 volumes. *Subject Headings:* **Mountain meteorology, Mount Weather, Virginia.**

1910

2K–30 551.524.36:551.43(429)

Brown, W. Piffe, **Winter temperatures on mountain heights.** *Royal Meteorological Society, Quarterly Journal,* 36(153):17–19, Jan. **1910.** table. **MH-BH**—A minimum thermometer was exposed every winter on summit of Y Glyder-fach (3262 ft.) near Snowdon. Table gives lowest minimum each year 1867/8–1908/9, with Llandudno and Greenwich for comparison. Mean 15.2°F. *Subject Headings:* **Mountain meteorology, Minimum temperatures, Wales.**

1911

2K–31 551.521(234.3)

Dorno, Carl, **Studie über Licht und Luft des Hochgebirges.** [Studies of light and air in the high mountains.] Braunschweig, F. Vieweg, **1911.** 153 p. 30 figs., 78 tables. **DWB**—This important work includes a great deal of observational material obtained at Davos, Switzerland, in a valley at 1560 m. Pt. I deals with radiation; (1) solar radiation (heat, light rays, U.V.); (2) total heat radiation and total brightness (cloudless sky and all days without regard to cloud). Pt. II discusses atmospheric electricity-potential gradient, conductivity, vertical current. An appendix gives measurements of scatter, ion content and velocity, and induced radio-activity. Features are the hourly tabulations of observations and the numerous diagrams. *Subject Headings:* **Mountain meteorology, Radiation, Atmospheric electricity, Davos, Switzerland.**

1912

2K–32 551.593

Larden, Walter, **Notes on solar halos and on "Brocken" spectres.** *Royal Meteorological Society, Quarterly Journal*, 38(161):33–38, Jan. **1912.** 2 figs. **MH-BH**—An account of observations of optical phenomena in Switzerland and a discussion of the "Brocken" spectre. *Subject Headings:* **Mountain meteorology, Halos, Brocken spectre, Switzerland.**

2K–33 551.521.12(234.3)

Maurer, J., **Aus älteren und neueren Messungen der Sonnenstrahlung auf hochalpinen Stationen.** [On older and newer measurements of solar radiation at high Alpine stations.] *Meteorologische Zeitschrift*, 29:561–569, **1912.** fig. **DWB**—Describes briefly actinometric studies by H. F. Weber (1883-1887) at various Alpine points up to 2800 m. and their expression as a function of air mass penetrated, with calculations of mean transmission coefficient. Work of C. G. Abbot at Washington—Mt. Wilson—Mt. Whitney is also referred to. *Subject Headings:* **Mountain meteorology, Solar radiation, Alps.**

2K–34 551.582(411)

von Hann, Julius, **The meteorology of the Ben Nevis Observatories.** *Royal Meteorological Society, Quarterly Journal*, 38(161):51–62, Jan. **1912.** 4 tables. **MH-BH**—Summary and detailed analysis of the observations on Ben Nevis (4407 ft.) and Fort William (42 ft.) 1884–1903. Essentially a review of "The meteorology of Ben Nevis" (Dec. 1883 to Dec. 1887), *Royal Society of Edinburgh, Transactions*, 34, 1890; Alexander Buchan, and Robert Traill Omond, "The meteorology of the Ben Nevis Observatories." Pt. II, 1888–1892 with Appendices, *ibid.*, 42, 1902; Pt. III, 1893–1897 with Appendix, *ibid.*, 43, 1905; Pt. IV, 1898–1904, with Appendices, *ibid.*, 44, 1910; J. Y. Buchanan, "Meteorology of Ben Nevis in clear and foggy weather," *ibid.*, 39(3), 1899; R. T. Omond, "Cyclonic winds on Ben Nevis," *Scottish Meteorological Society, Journal*, 8(4), 1892. *Subject Headings:* **Mountain meteorology, Ben Nevis Observatory, Scotland.**

1914

2K–35 551.552:551.43

Hesselberg, Th. and Sverdrup, H. U., **Über den Einfluss der Gebirge auf die Luftbewegung längs der Erdoberfläche.** [On the influence of mountains on air movement along the earth's surface.] *Leipzig, Universität, Geophysikalisches Institut, Veröffentlichungen, 2nd Ser.*, 1(4):101–116, **1914.** 10 figs., 2 plates, 3 tables. **DWB**—There is a close relation between isobars and stream lines even in mountains. Mountains influence stream lines (1) by causing local divergence and convergence points in such a way that at morning observations in winter divergence points are always over the mountains, convergence over the plain; (2) they alter the course of stream lines in great tongues. Mountains also cause local maxima and minima of pressure at points of divergence and convergence, and alter the course of isobars in such a way that when air transport is towards a mountain, pressure is raised to windward and lowered to leeward. Illustrated by charts of streamlines and isobars across Alps. *Subject Headings:* **Mountain meteorology, Streamlines, Alps.**

2K–36 551.501.9:551.43

Reed, William Gardner, **Meteorology at the Lick Observatory.** *Monthly Weather Review*, 42:339–345, **1914.** 4 figs., 5 tables. **DWB**—An account of the site on Mount Hamilton, California, 4209 ft., with descriptions and photos of meteorological instruments and exposure. Observations 1880 to date listed with tables of monthly means. See also: *U. S. Weather Bureau, Bulletin L. Subject Headings:* **Mountain observatories, Mountain meteorology, Lick Observatory, Mount Hamilton, California.**

1915

2K–37 551.521.32:551.43

Ångström, Anders, **A study of the radiation of the atmosphere. Based upon observations of the nocturnal radiation during expeditions to Algeria and to California.** *Smithsonian Miscellaneous Collections*, 65(3), **1915.** 159 p. **DLC**—Discusses observations at Bassour, Algeria (1100 m.) in 1912 and at various heights in California up to Mt. San Antonio (3000 m.), Mt. San Gorgonio (3500 m.) and Mt. Whitney (4420 m.). At Bassour effective atmospheric radiation in gm.cal./min. was fitted by $0.453-0.134 \exp.(-0.10\ \rho)$ where ρ is vapor pressure in mm., and in California by $0.439-0.158 \exp.(-0.069\ \rho)$. Comparative upper air observations are included. *Subject Headings:* **Mountain meteorology, Radiation, Algeria, California.**

2K–38 551.501.9:551.509.53

Fergusson, Sterling Price, **The value of high-level data in forecasting changes of temperature—a contribution to the meteorology of Mount Rose, Nevada.** *Nevada, University, Technical Bulletin,* No. 83, **1915.** 30 p. **DWB**—Unchecked. *Subject Headings:* **Mountain meteorology, Temperature forecasting, Mount Rose, Nevada.**

1916

2K–39 551.58(235,85)

†*Bowman, Isaiah, **The Andes of southern Peru: geographical reconnaissance along the seventy-third meridian.** New York, Holt, **1916.** 336 p. 204 figs., refs. **DPU**—In Chap. IX (p. 121–156) entitled "Climatology of the Peruvian Andes," there is a most comprehensive treatment of climatic belts in general, and of the specific belts (coastal, eastern border and Inter-Andean Valley), with analysis of general circulation, wind temperature, rainfall and cloudiness, supplemented by numerous wind roses, schematic diagrams of the effect of the changing relief in the clouds and precipitation, etc. as well as the effect of the climate on human activity and vegetation. In Chap. X (p. 157–181), entitled "Meteorological records from the Peruvian Andes," the observations of the several Yale expeditions in 1907, 1911, 1912 and 1914–15 are analyzed and summarized in great detail. Records at Machu Picchu (8,500 ft.), Santa Lucia (15,500 ft.), Morococha (14,300 ft.) and Cochabamba, Bolivia (8,000 ft.) are separately treated, with emphasis on diurnal variability in temperature, cloudiness and wind and on the seasonal anomalies in rainfall and cloudiness. Six years of rainfall records are shown graphically for Morococha and shorter records for other places. Wind roses are also given for each month and place. The remarkably sudden advent of winter and summer (there are no transition seasons) at the high level stations (over 14,000 ft.) is strikingly revealed by the data. At Morococha (12°S.) winter is solely in June and July, the interdiurnal range in temperature is only 1° to 2°F. on the average. Crops cannot be grown above 14,000 ft. (barley above 13,000, wheat >12,000 ft., corn >11,000 ft. and grapes >10,000 ft.). The highest human habitation found (and thought to be the highest in the world) was at 17,100 ft., just below the snow line. *Subject Headings:* **Climatology, Mountain meteorology, Andes, Peru, Bolivia.**—*M.R.*

1919

2K–40 551.574.42

Köhler, Hilding, **Studien über die Nebelfrostablagerungen auf dem Pårtetjåkko.** [Studies on rime deposits on Pårtetjåkko.] *Naturwissenschaftliche Untersuchungen des Sarekgebirges in Schwedisch-Lappland,* 2, Abt. 1, No. 1:1–38, **1919.** 12 figs., 6 plates, 4 tables. **DWB**—The observatory is in fog for most of the year and in winter spikes of rime may reach 1 meter length. Observations were made by A. Hamberg of accumulation on 4 copper spheres on posts. The terms *Nebelfrost* and *Rauheis* (rime), *Rauhfrost* (hard rime) and *Rauhreif* (soft rime) are defined and their physics discussed. Influence of meteorological elements considered. The contribution of rime to total "precipitation" is large but variable on objects a meter or so high, only about $\frac{1}{3}$ as great on level ground, where it does not exceed water equivalent of 260 mm. a year. Occurrences of soft hail are also discussed. Volume of rime is plotted against humidity; nearly all occurrences lie between curves for saturation with respect to ice and water. Some striking photos are reproduced. *Subject Headings:* **Mountain meteorology, Hoar frost, Rime, Definitions, Pårtetjåkko, Swedish Lapland.**

2K–41 551.577.2(969)

Larrison, G. K., **Uncle Sam's dampest corner.** *Monthly Weather Review,* 47:303–305, May **1919.** 8 figs., table. **DWB**—Quotes heavy annual totals at high levels in Hawaii—Mount Waialeale (5080 ft.), 476 inches/year, Puu Kukui (Maui, 5000 ft.), 369 inches. Refers to great contrasts in a short distance due to altitude or exposure. *Subject Headings:* **Mountain meteorology, Rainfall distribution, Hawaiian Islands.**

1920

2K–42 551.521.2

Boutaric, A., **Sur l'intensité du rayonnement nocturne aux altitudes élevées.** [Intensity of nocturnal radiation at elevated stations.] *Académie des Sciences, Paris, Comptes Rendus,* 170:1195–1196, **1920.** 2 tables. Summary in *Science Abstracts,* 23:545, **1920.** **DLC**—Author derived a formula for nocturnal radiation $r = \pi\sigma T^4 F(f_0)$ where f_0 is vapor pressure. To test this, radiation on clear nights was measured at Pic du Midi (2859 m.) and Montpellier (near sea level). Both series agreed with the formula. *Subject Headings:* **Mountain meteorology, Terrestrial radiation, Pic du Midi, France.**

2K–43 551.577.51(794)

Varney, B. M., **Monthly variation of the precipitation-altitude relation in the central Sierra Nevada of California.** *Monthly Weather Review*, 48:648–650, **1920.** 2 figs., table. **DWB**—Rate of increase of precipitation with height at a series of stations across the range from 71 to 7017 ft. varies from 0.23 in./100 ft. in Jan. to 0.004 in July up to 4532 ft. on windward slopes, from 0.168 (Jan.) to 0 (July) 4532 ft. to summit. On leeward slope rate varies from a decrease of 0.363 in./100 ft. downwards in Jan. to an increase of 0.006 in July and Aug. Variations in level of maximum precipitation (4700 ft., Dec.–April, 7017 ft., July) are also discussed. *Subject Headings:* **Mountain meteorology, Precipitation, California.**

2K–44 551.515.11(234.3)

§von Ficker, Heinrich, **Der Einfluss der Alpen auf Fallgebiete des Luftdruckes und die Entstehung von Depressionen über dem Mittelmeer.** [The influence of the Alps on regions of falling pressure and the origin of depressions over the Mediterranean.] *Meteorologische Zeitschrift*, 37:350–363, **1920.** 10 figs., 5 tables. **DWB**—When a depression approaches the Alps, the simple primary wave is modified by a secondary thermowave and the depression is deformed by a secondary on its eastern side. Two types are identified according to depth of cold inbreak, and typical charts are shown. *Subject Headings:* **Mountain meteorology, Depressions, Alps.**

1921

2K–45 551.521.16(234.3)

Dorno, Carl, **Dauerregistrierungen der Ortshelligkeit von Davos, Oktober 1919 bis Oktober 1920, mittels der photoelektrischen Zellenmethode.** [Records of duration of local brightness at Davos, Oct. 1919 to Oct. 1920, by the photoelectric cell method.] *Meteorologische Zeitschrift*, 38:1–8, **1921.** fig., tables. **DWB**—Observations with a cadmium cell of the illumination of a horizontal plate, expressed in meter-candles $\times 10^{-3}$, are set out by hours and months and discussed. *Subject Headings:* **Mountain meteorology, Daylight illumination, Davos, Switzerland.**

2K–46 551.582(239,914)

Hann, Julius, **Gebirgsklima der Philippinen.** [Mountain climate of the Philippines.] *Meteorologische Zeitschrift*, 38:203–205, **1921.** table. **DWB**—Monthly temperature data for Baguio (1456 m., plateau) and Mt. Mirador (1512 m.) are compared with Manila. Observations on Banakao (2100 m.) give a temperature lapse of 0.54°C./100 m. *Subject Headings:* **Mountain meteorology, Philippines.**

2K–47 551.553.1:551.558.21

Kleinschmidt, Ernst, **Der tägliche Gang des Windes in den freien Atmosphäre und auf Berggipfeln.** [The diurnal variation of the wind in the free atmosphere and on mountain peaks.] *Beiträge zur Physik der freien Atmosphäre*, 10:1–14, **1921.** 2 plates, 5 tables. **DWB**—Daily variation of wind on Säntis (2500 m.), Sonnblick (3106), Obir (2140) and Pike's Peak (4308) are represented by harmonic terms of S. and W. components. These are discussed in terms of friction, half-day and day pressure waves, and departures due to the mountain itself. Daily variations of wind are represented by wind ellipses. *Subject Headings:* **Mountain meteorology, Upper air winds.**

2K–48 551.521.11:551.576.2(43)

Pollak, Leo Wenzel, **Sonnenscheindauer und Bewölkung auf dem Donnersberge und in Aussig a.d. Elbe.** [Sunshine duration and cloudiness on the Donnersberg and in Aussig on the Elbe.] *Meteorologische Zeitschrift*, 38:71–78, 106–112, **1921.** fig., 15 tables. **DWB**—Pt. I, Donnersberg, 853 m., gives possible sunshine, hourly means by seasons, monthly means and data of cloudiness. Part II deals with Aussig. Sunshine % = 100 − cloud %. *Subject Headings:* **Mountain meteorology, Sunshine duration, Cloudiness, Donnersberg, Germany.**

1922

2K–49 551.524.31(45)

Eredia, Filippo, **Sul massimo notturno della temperatura dell' aria all'Etna.** [On the nocturnal maximum of the temperature of the air on Etna.] (*R.*) *Accademia dei Lincei, Rendiconti*, Rome, 5th Ser., 31(11):508–513, Dec. **1922.** table. **DLC**—An appreciable rise of temperature occurs from about 0–4 h. followed by a second minimum. The same has been observed at other peak stations but not in adjacent lowlands. The cause is not clear but various factors are discussed. *Subject Headings:* **Mountain meteorology, Minimum temperatures, Mount Etna, Sicily.**

2K–50 551.508.77 551.577.2(234.3)

Gautier, Raoul, **Nouvelles mesures des chutes de pluie et neige au Grand Saint-Bernard.** [New measurements of rain and snow falls on the Great St. Bernard.] *Archives des Sciences physiques et naturelles*, Geneva, 5th Ser., 4:343–353, Sept.–Oct. **1922.** 2 figs., 2 tables. **DLC**—Describes the totalisators, 40 of which are in use in the Alps, often above 3000 meters. Then gives totals of rain and melted snow, and of snow, recorded by old and new pluviometers on Great St. Bernard 1917–1922 and ratio. *Subject Headings:* **Mountain meteorology, Rain gages, Snow gages, Great St. Bernard, Alps.**

2K–51 551.558.21:551.43

Georgii, Walter, **Die Windbeeinflussung durch Gebirge.** [The influence of mountains on winds.] *Beiträge zur Physik der freien Atmosphäre*, 10:178–184, **1922.** 2 figs., 3 tables. **DWB**—The increased temperature lapse on a mountain slope causes increased wind speed up to a level above a mountain peak by about 30% of its height, varying according to the wind direction and the slope. Little Feldberg (820 m.) taken as example. Winds are also diverted, differently according to direction. *Subject Headings:* **Mountain meteorology, Upper air winds.**

1923

2K–52 551.582(85)

Bailey, Solon I., **Peruvian meteorology. Observations made at the auxiliary stations, 1896–1900.** *Harvard University, Astronomical Observatory, Annals*, 86(3):123–194, **1923.** 34 tables. **DLC**—Sets out observations of cloud, wind, humidity and rainfall at six stations of different heights, including the summit of El Misti (19,200 ft.) on a number of isolated days. *Subject Headings:* **Mountain meteorology, El Misti, Peru.**

2K–53 551.501.9:551.43

Deslandres, H., **Les observations de montagne.** [Mountain observations.] *La Nature*, Paris, 51(2):198–202, **1923.** 7 figs. **DLC**—Brief descriptions and photos of observatories of Pic du Midi and Mont Blanc and Lick Observatory. Mainly astronomical but brief meteorological notes. *Subject Headings:* **Mountain meteorology, Mountain observatories, Lick Observatory, California, Pic du Midi, Mont Blanc, France.**

2K–54 551.558.21:551.43

Georgii, Walter, **Die Luftströmung über Gebirgen.** [Air currents over mountains.] *Meteorologische Zeitschrift*, 40:108–112, **1923.** Remarks by A. Wagner and reply, p. 309–311. 2 figs., tables. **DWB**—Deflection of wind on Feldberg (Taunus) compared with free atmosphere over Frankfurt is tabulated by directions and speeds. Speed is greater over Feldberg up to 12 m./sec., then less. This is explained by temperature deficit on mountains compared with free air, caused by diversion of winds upwards. Height to which mountain influence extends is related to temperature gradient. *Subject Headings:* **Mountain meteorology, Streamlines, Feldberg, Germany.**

2K–55 551.582(515)

Guillarmod, C. Jacot, **Le climat de L'Éverest.** [The climate of Everest.] *Écho des Alpes*, Geneva, 59:343–350, **1923. PPAN**—On the northern slope of Mt. Everest there is little snow even in May. Snow is at a minimum on the high summits during the spring, summer and autumn. Under the influence of the prevailing southern winds, winters are characterized by heavy snowfall. The snowfall regime is opposite to that prevailing in the Alps. The climate is characterized by a short, rainy season succeeded by long dry seasons as the humid south winds are replaced by dry winds from Australasia. The snow that falls between June and September is vaporized. On the southern slope the snow line is at 4500 m.; on the northern slope it is at 5800 m. A qualitative description of the climate of Central Asia and of India south of the Himalayas is presented. *Subject Headings:* **Mountain meteorology, Snow, Mount Everest, Tibet.**—*I.L.D.*

2K–56 551.582(43)

Hartmann, Wilhelm, **Das Klima des Feldberggipfels im Schwarzwald. Eine klimatologische Skizze.** [The climate of the summit of Feldberg in the Black Forest. A climatological sketch.] *Zeitschrift für angewandte Meteorologie*, 40:4–14, **1923.** 4 tables. **DWB**—Station is 1495 m. above sea level. Author gives detailed tables for 1915–1918 of temperature, humidity, precipitation, weather, sunshine, wind direction and speed. There are only two seasons, separated by rapid transitions. *Subject Headings:* **Mountain meteorology, Black Forest, Germany.**

2K–57 551.5:551.43(235,515)

Longstaff, T. G., **Meteorological notes from the Mount Everest Expedition of 1922.** *Royal Meteorological Society, Quarterly Journal*, 49:273–275, **1923.** 2 plates, 2 tables. **MH-BH**—The few meteorological observations made are summarized. They include air temperatures May 16–28 at Base Camp (16,500 ft.) with a few up to 25,000 ft. (effect of shelter important) and a longer series of minimum temperatures. General notes on weather and snow line on Tibetan uplands are given. *Subject Headings:* **Mountain meteorology, Mount Everest, Tibet.**

2K–58 551.573(234.3)

Maurer, J. and Lütschg-Loetscher, O., **Einige Ergebnisse über die Verdunstungsgrösse freier Wasserflächen im schweizerischen Hochgebirge.** [A few results on amount of evaporation from free water surfaces in the Swiss high mountains.] *Schweizerische Meteorologische Zentralanstalt, Annalen*, 60, Anhang 6, **1923.** 23 p. 5 figs., 7 photos, 6 tables, 37 refs. **DWB. Über Verdunstungsmessungen im schweizerischen Hochgebirge.** [On evaporation measurements in the Swiss high mountains.] *Meteorologische Zeitschrift*, 42:111–114, **1925.** fig., 2 tables. **DWB**—Observations in July through October with zinc or glass pans of 24–50 cm. diameter, with Livingstone atmometer at various heights from 656–2187 m. and direct measurements on lakes in northern Alps were compared with wind speed and temperature of air and water. Evaporation from Hopschen (?) Lake was in general less than from lakes at the foot of the Alps, averaging 2 mm./day during the period. *Subject Headings:* **Mountain meteorology, Evaporation measurement, Swiss Alps.**

2K–59 551.5:551.43(44)

Mengel, Octave, **Caractère climatique de Font-Romeu et de Mont-Louis. Tiré des conditions générales de l'atmosphère dans les Pyrénées-Orientales.** [Climatic characteristics of Font-Romeu and Mont-Louis. Summary of the general conditions of the circulation of the atmosphere in the eastern Pyrenees.] *France, Office National Météorologique, Memorial*, 1(5), **1923.** 16 p. plate, 2 figs., tables. **DLC**—This study, based on observations at Font-Romeu (1800 m.) and Mont-Louis (1600 m.), discusses the seasonal variation of winds with different synoptic types as modified by the mountains, the complex distribution of climatic types and a series of photos showing the evolution of clouds. *Subject Headings:* **Mountain meteorology, Winds, Climatic types, Clouds, Pyrenees, France.**

2K–60 551.577.2(485)

Wallén, Axel, **L'eau tombée dans la haute montagne de la Suède.** [Precipitation in the high mountains of Sweden.] *Geografiska Annaler*, 5:72–104, **1923.** 12 figs., hypsometric chart, 4 tables. **DLC**—A discussion of the rainfall at stations up to 1000 m. above sea level and runoff and evaporation in mountain basins. A map of isohyets is constructed from the observations and compared with one calculated from distance from sea. Straight lines are fitted to rainfall plotted against height in various basins. Finally, a new rainfall chart of the high mountain area is constructed. *Subject Headings:* **Mountain meteorology, Rainfall, Sweden.**

1924

2K–61 551.577.51

Bénévent, Ernest, **Du rôle des montagnes dans la formation de la pluie d'après les nouvelles theories norvégiennes.** [The role of mountains in the formation of rain according to the new Norwegian theories.] *Revue de Géographie Alpine*, Grenoble, 12:173–187, **1924.** 3 figs. Review in *Geographical Review*, 15:311, **1925. DLC**—After a summary of BJERKNES' theory of cyclones, author states that purely orographic rains are of small intensity (in Norway) and then describes the effect of a mass of cold air trapped between mountains and an advancing warm front, causing rain which continues after the front has passed. The resulting increase in the duration of rain partly accounts for the increased rainfall in mountain regions. Finally, he discusses various problems of rain in the Alps. *Subject Headings:* **Mountain meteorology, Orographic rainfall.**

2K–62 551.515.8:551.43

Bjerknes, J., **Diagnostic and prognostic applications of mountain observations.** *Geofysiske Publikasjoner*, 3(6), **1924.** 35 p. **DLC**—A discussion of abnormalities in the structure of cyclones due to the presence of the Alps, based on charts for Jan. 31–Feb. 2, 1913, which included a complex front and a rapidly moving young depression. The warm front of the latter is examined in detail. It is found that the surface observations of temperature may not represent the real air mass temperatures. *Subject Headings:* **Mountain meteorology, Weather forecasting, Cyclones, Alps.**

2K–63 551.552(436)

Defant, A., **Die Windverhältnisse im Gebiete der ehemaligen österr.-ungar. Monarchie.** [The wind conditions in the region of the former Austro-Hungarian Kingdom.] *Vienna, Zentral-*

anstalt für Meteorologie und Geodynamik, Jahrbuch 1920, Anhang, **1924.** 14 p.+18 charts. **NN**—The region includes the eastern Alps and the Carpathians. Mean streamlines are shown for January and July (7 h. and 14 h.). *Subject Headings:* **Wind distribution, Streamlines, Alps, Carpathians.**

2K–64 551.586

Hill, Leonard Erskine, **Sunshine and the open air; their influence on health, with special reference to Alpine climate.** London, Edward Arnold, **1924.** 132 p. 9 plates, 12 figs., 38 tables. **DWB**—Includes a discussion of Alpine climate, including biological action of sunshine, radiant energy and light, metabolism and cooling power, and comparisons with Britain and mountains in Montana. The importance of the wavelength of light is discussed, especially the action of ultraviolet. *Subject Headings:* **Mountain meteorology, Radiation, Physiological climatology, Alps.**

1925

2K–65 551.578.46

Allix, André, **Les catastrophes de la neige.** [Snow catastrophes.] *Matériaux pour l'Étude des Calamités*, Geneva, 2:37–57, **1925.** 20 refs. English summary p. 56–57. **DLC**—Some historical avalanches in Switzerland are described. Causes and protective work are discussed. *Subject Headings:* **Mountain meteorology, Avalanches, Swiss Alps.**

2K–66 551.501.9:551.43

Dorno, Carl, **Das physikalisch-meteorologische Observatorium in Davos.** [The physical-meteorological observatory at Davos.] *Naturforschende Gesellschaft Graubündens, Jahresberichte, Neue Folge*, 64:215–219, **1925–6.** 4 plates, 7 photos. **DLC**—An account of the set-up of the observatory for work on atmospheric electricity, radio-activity, radiation of all types, optical phenomena and medical climatology. The instruments are shown in a series of excellent photos with keys. *Subject Headings:* **Mountain meteorology, Mountain observatories, Davos, Switzerland.**

2K–67 551.593.55

Gruner, P., **Beiträge zur Kenntnis der Dämmerungserscheinungen und des Alpenglühens. I. Historische-chronologische Übersicht der schweizerischen Beobachtungen und Veröffentlichungen über Dämmerungsfarben und Alpenglühen. 2. Historische-chronologische Übersicht der ausserschweizerischen Beobachtungen und Veröffentlichungen über Dämmerungen, atmosphärische-optische Störungen und andere damit verwandte Erscheinungen.** [Contributions to the knowledge of twilight phenomena and Alpine glows. 1. Historical-chronological summary of Swiss observations and publications on twilight colors and Alpine glows. 2. Historical-chronological summary of non-Swiss observations and publications on twilights, atmospheric-optical disturbances and other related phenomena.] *Schweizerische Naturforschende Gesellschaft, Neue Denkschriften*, 57, **1921.** 11+246 p. *Ibid.*, 62(1), **1925.** 8+190 p. plates. **DLC**—*Subject Headings:* **Mountain meteorology, Twilight phenomena, Alpenglow.**

2K–68 551.577:551.43

Ono, Suminosuke, **On orographic precipitation.** *London, Edinburgh and Dublin, Philosophical Magazine*, 6th Ser., 49:144–164, **1925.** 3 figs., 4 tables, 26 equations. **DLC**—Equipotential surfaces and stream lines behind a smooth mountain 3 km. high are calculated; variation of wind with height and stream-line profile agree with pilot balloon observations. Amount of precipitation is calculated across a mountain district in Japan and found to agree with measured values in Jan. *Subject Headings:* **Mountain meteorology, Orographic rainfall, Streamlines, Japan.**

2K–69 551.501.9(09)(234.3)

Tutton, A. E. H., **The story of the Mont Blanc Observatories.** *Nature*, London, 115:803–805, **1925. DLC**—Translation of a statement by Joseph Vallot. Existing observatory at 13,500 ft. and separate refuge hut at 14,312 ft. were snow-covered and rebuilt in 1898. An observatory constructed on the snow of the summit by P. J. C. Janssen in 1893, sank in the snow. *Subject Headings:* **Mountain meteorology, Mountain observatories, Mont Blanc Observatory, France.**

2K–70 551.558.21

von Ficker, Heinrich, **Bemerkungen über den Verlauf von Stromlinien im Gebirge.** [Remarks on the course of streamlines in mountains.] *Berlin, Preussisches Meteorologisches Institut, Veröffentlichungen*, No. 327:31–46, **1925.** 11 fig. Reprint available. **DLC**—An investigation, with flow diagrams, based on observations with a manned balloon 1910–1914 at Innsbruck. A difficulty is that the balloon rises and sinks less than do the streamlines. Flow is then described in föhn winds and with NW winds with calm in the valleys. Some remarkable examples of lee eddies are illustrated. *Subject Headings:* **Mountain meteorology, Lee eddies, Streamlines, Innsbruck, Austria.**

2K–71 551.524.4:551.43

von Ficker, Heinrich, **Vertikale Temperaturgradienten im Gebirge.** [Vertical temperature gradients in mountains.] *Berlin, Preussisches Meteorologisches Institut, Veröffentlichungen,* No. 335: 45–62, **1926.** 9 figs. Reprint available. **DLC**—Owing to movements along slopes, divergence etc., true vertical temperature gradient cannot be obtained from two stations of different height or even from soundings in moving air. Various cases are discussed; most unsatisfactory is difference between a peak and a valley with stagnant air, which often gives superadiabatic gradient by day, inversion by night. Author then discusses temperature gradient during föhn, between peaks of different heights, across and along valleys. Owing to vertical currents, sounding balloons are also unsatisfactory in mountains. Cold catabatic winds often give superadiabatic gradients owing to mixing with warmer air below. *Subject Headings:* **Mountain meteorology, Vertical temperature gradient, Mountain winds.**

1926

2K–72 551.582(234.3)

†*Bénévent, Ernest, **Le climat des Alpes françaises.** [The climate of the French Alps.] *France, Office National Météorologique, Memorial* No. 14, **1926.** 435 p. 80 figs., 8 plates, 84 tables, 147 refs. **DLC**—Includes a mass of instrumental data and also personal observations by the author. Pt. I discusses relation of winds to pressure, and local winds. Pt. II deals with temperature, giving true as well as MSL isotherms, frequencies of extremes, spells and their causes. Pt. III discusses humidity, including fog, cloud, rain and snow but not vapor pressure or relative humidity. The complex isohyets are mapped and their relation to orography discussed. Snowfall and its effect on the life of the mountaineers is described at length. Climatically, the French Alps are sharply divided into two contrasting regions with a humid temperate type north of 45°N. and a Mediterranean type to the south. *Subject Headings:* **Mountain meteorology, French Alps.**

2K–73 551.501.9:551.521.1

Götz, F. W. Paul, **Sonnenstrahlungsmessungen in Arosa.** [Solar radiation measurements in Arosa.] *Sonnblick-Verein, Jahrbuch,* 35:17–25, **1926.** 5 figs. **MH-BH**—Photographs and description of surroundings and installation at the radiation-climatic observatory (1860 m.). *Subject Headings:* **Mountain meteorology, Mountain observatories, Arosa, Switzerland.**

2K–74 551.521.64 551.594.11

Lautner, Peter, **Über Erfahrungen bei luftelektrischen Messungen auf der Zugspitze.** [On experiences with atmospheric electrical measurements on the Zugspitze.] *Meteorologische Zeitschrift,* 43:488–489, **1926. DWB. Luftelektrische Studien auf der Zugspitze.** [Atmospheric electrical studies on the Zugspitze.] *Deutsches meteorologisches Jahrbuch, Bayern,* 48:D1–8, **1926. DWB**—A summary of measurements of: 1) cosmic radiation; 2) potential gradient (with harmonic analysis of diurnal variation); 3) conductivity; 4) space charge. *Subject Headings:* **Mountain meteorology, Cosmic radiation, Potential gradient, Zugspitze, Germany.**

2K–75 551.506.5(235)

Somervell, T. H. and Whipple, F. J. W., **The meteorological results of the Mount Everest Expedition. A. The observations. B. Some lessons from the observations.** *Royal Meteorological Society, Quarterly Journal,* 52:131–142, **1926.** 3 photos, 4 tables. Discussion p. 142–143. **MH-BH**—Table 1 gives observations in Tibet 13,300–16,500 ft. and Base Camp, April 7–May 5, 1924, followed by weather diary at the camps April 29–June 11. Whipple discussed the lapse rate, diurnal variation of temperature (very small or zero from 19,000 ft. up), comparison with temperatures at same height over India, and some observations of temperature on black fur (up to 124°F.) and with katathermometer. *Subject Headings:* **Mountain meteorology, Expeditionary climatic data, Mount Everest, Himalayas.**

2K–76 551.506.3(73)

Summaries of climatological data by sections. 2nd ed. 3 Vols. *U. S. Weather Bureau, Bulletin W,* **1926. DWB**—A full tabulation of the climatic data for the United States in monthly tables (precipitation, snowfall, mean and extreme temperature, relative humidity, sunshine, winds, first and last killing frosts, etc.). A number of high level and mountain stations are included. *Subject Headings:* **Climatic data, United States.**

2K–77 551.552:551.43(749.1)

von Ficker, Heinrich, **Richtung von Wind und Wolken auf Teneriffa.** [Direction of wind and clouds on Tenerife.] *Vienna, Akademie der Wissenschaften, Math.-Naturwiss. Klasse, Sitzungsberichte,* 2a, 135 (7–8):307–322, **1926.** 7 tables. **DLC**—Also in: *Vienna, Zentralanstalt für Meteorologie und Geodynamik, Festschrift* 1926. p. 15–30. **NN**—Data are used for 6 stations, 100–2367 m.

Seasonal frequencies of 8 wind directions and mean force three times daily are set out. The data are completed by directions of Ci, A.Cu and Cu and Ni clouds. The structure of the winds over the island is summarized. *Subject Headings:* **Mountain meteorology, Upper air winds, Tenerife, Canary Islands.**

2K–78 551.524.4(749.1)

von Ficker, Heinrich, **Temperatur und vertikale Temperaturabnahme auf Teneriffa.** [Temperature and vertical temperature decrease on Tenerife.] *Annalen der Hydrographie und Maritimen Meteorologie, Köppenheft*, p. 27–32, **1926.** 2 figs., 3 tables. **DWB**—Corrected monthly means of temperature are tabulated for 13 stations 10–3700 m. and the decrease of temperature per 100 m. height calculated on S.E. and N. sides. In summer (trade wind period) the decrease is very rapid between 0–330 and 2700–3700 m., with an inversion 330–547 m. *Subject Headings:* **Mountain meteorology, Temperature, Tenerife, Canary Islands.**

2K–79 551.515.8(749.1)

von Ficker, Heinrich, **Der Vorstoss kalter Luftmassen nach Teneriffa.** [The advance of cold air masses to Tenerife.] *Berlin, Preussisches Meteorologisches Institut, Abhandlungen*, 8(5):3–34, **1926.** 6 figs., 17 tables. **DLC**—Although strong cooling by advection is rare on the lowlands of Tenerife, cold waves often occur at the mountain stations; this is due to rapid masking of lower air in its passage over the warm sea. The winds, humidity, precipitation, pressure conditions and decrease of temperature with height are discussed on the average of a number of examples and the dynamics illustrated. The individual cases are set out with observations at Guimar (lowland) and Izaña or Las Canadas (peak). *Subject Headings:* **Mountain meteorology, Cold waves, Tenerife, Canary Islands.**

1927

2K–80 551.501.9:551.43(73)

Brooks, C. F., **American mountain observatories.** *American Meteorological Society, Bulletin*, 8(4):66–67, April **1927. MH-BH**—References to Pike's Peak, Mt. Washington, Blue Hill and Mt. Rose (Nevada). *Subject Headings:* **Mountain observatories, United States.**

2K–81 551.577.51(46)

Doporto, Mariano, **Las lluvias orográficas. Aplicación a la Sierra de Grazalema.** [Orographic rains. Application to the Sierra de Grazalema.] *Sociedad Española de Meteorología, Anales*, 1:5–12, **1927.** 3 figs., 4 tables. **DWB**—Mathematical examination of the distribution of rainfall in Sierra de Grazalema, behind Cadiz (1654 m.), gave a formula for rainfall in terms of height, slope and distance. Calculations for specimen months fit a generalized curve based on topography fairly well. *Subject Headings:* **Mountain meteorology, Orographic rainfall, Spain.**

2K–82 551.582(494)

†Dorno, Carl, **Grundzüge des Klimas von Muottas-Muraigl (Oberengadin). Eine meteorologisch-physikalisch-physiologische Studie.** [Bases of the climate of Muottas-Muraigl (Upper Engadine). A meteorological-physical-physiological study.] *Davos, Schweizerisches Institut für Hochgebirgs Klima und Tuberkulose-Forschung, [Publicationen]*, No. 3, **1927.** 177 p. 11 figs., 41 tables. **DLC**—The laboratory is on the N.E. slope of an Alpine plateau at a height of 2456 m. Observations were made during 5 periods in 1923–24, and in this volume they are described in great detail and compared with those for other places. The first section describes the meteorology and general weather. Sec. 2 deals with radiation (sunshine duration and intensity, infrared, UV of various lengths), radiation from the sky, nocturnal radiation. Sec. 3 describes optical phenomena—sky color, aureoles, scintillation, visibility, polarization, twilight phenomena. Sec. 4, on atmospheric electricity, includes potential gradient, conductivity, vertical current and cosmic radiation. Section 5, on physics and physiology, is of great bioclimatic interest. It discusses physical effects of radiation, humidity and wind, effective temperature under various conditions, snow effects, drying power, cooling power in the open and indoors, and their physiological effects, classification of climatic types, discussion of katathermometer and frigorimeter, physiological effects of atmospheric electricity and chemical composition of the air. Instruments are described and the observations set out in a series of hourly tables. A supplement lists 122 publications by the author. *Subject Headings:* **Mountain meteorology, Physiological climatology, Swiss Alps.**

2K–83 551.579(234.3)

Fischer, Karl, **Niederschlag und Abfluss in den schweizer Hochalpen, besonders in Mattmarkgebiet.** [Rainfall and runoff in the Swiss High Alps, especially in the Mattmark region.] *Meteorologische Zeitschrift*, 44:285–292, **1927.** 3 figs., 3 tables. **DWB**—A review of a book by Otto Lütschg: "Über Niederschlag und Abfluss im Hochgebirge. Sonderdarstellung des Mattmark-

gebietes. Ein Beitrag zur Fluss-und Gletscherkunde der Schweiz." [Rainfall and runoff in high mountains, especially the Mattmark region. A contribution to the knowledge of rivers and glaciers in Switzerland.] Zurich, Sekretariat des Schweizerischen Wasserwirtschaftsverbandes, 1926. 480 p. 142 figs., 47 plates. The water-balance in the basins of the Matter-Visp and Saaser-Visp is discussed (the Visp is a tributary of the Rhone). Account is taken of the melt-water of the Wallis (Valais) glaciers. *Subject Headings:* **Mountain meteorology, Water supply, Swiss Alps.**

2K–84 551.521.11:551.43

Gy, Marczell, **Hegy és völgy napsütése.** [Sunshine in mountain and valley.] *Időjárás*, 31:97–105, 129–140, **1927.** 5 figs., 5 tables, equations. German summary p. 124–127, 153–158. **DWB**—Summarizes possible duration of sunshine on a mountain (including depression of horizon), intensity due to decreased pressure, and amount of heat on horizontal and inclined surfaces, effect of cloudiness, and the effect of variations of insolation in short distances in releasing convection. *Subject Headings:* **Mountain meteorology, Insolation, Hungary.**

2K–85 551.586(749.1)

Kestner, Otto; Peemöller, Friedrich and Schadow, Hermann, **Ergebnisse einer Klimaexpedition nach Teneriffa.** [Results of a climatic expedition to Tenerife.] *Archiv für die gesamte Physiologie*, Bonn, 217 (3–4):492–503, **1927.** 8 tables. **DLC**—Measurements of air intake and breathing rate were made at various heights up to 3270 m. (pressure 509 mm.) on Tenerife, and compared with shortest UV radiation. It was found that a change of climate caused a short-lived increase of air intake. Short UV radiation deepened breathing and increased air consumption, warming reduced the latter. At 2100 m. blood pressure was lower than on the plain. *Subject Headings:* **Mountain meteorology, Physiological climatology, Ultraviolet radiation, Tenerife, Canary Islands.**

2K–86 551.586:551.43

Kestner, Otto and Schadow, Hermann, **Strahlung, Atmung und Gaswechsel Versuche am Jungfraujoch.** [Radiation, breathing and gas exchange investigations on the Jungfraujoch.] *Archiv für die gesamte Physiologie*, Bonn, 217(3–4):473–491, **1927.** 4 figs., 9 tables. **DLC**—Observations at 3470 m. showed that diminished oxygen pressure caused deep breathing which was relieved by breathing oxygen, and increased need of oxygen. Blood pressure was lower than on plains. Breathing and oxygen need increased by the shortest UV radiation which is strong even through thick cloud; need for oxygen, but not deep breathing, relieved by warmth. Sky radiation was small compared with direct solar radiation, reflection from snow was large. *Subject Headings:* **Mountain meteorology, Physiological climatology, Switzerland.**

2K–87 551.558.21

Koschmieder, Harald, **Die Luftströmungen am Berghindernisse in der freien Atmosphäre.** [Air currents in the free air around mountain obstacles.] *Beiträge zur Geophysik*, 15:285–303, **1927.** 12 figs., 15 refs. **DWB**—In Pt. 1 the methods of measurement are described (balloons, kites, potential temperature, gliders). In Pt. 2 the influence of the form of the obstacle, height and meteorological conditions are discussed. Pt. 3 deals with the field of flow about a hill, Pt. 4 about a mountain (in the example a simplified form 2000 m. high showing a lee eddy). *Subject Headings:* **Mountain meteorology, Lee eddies, Upper air winds.**

2K–88 551.506.1(494)

Resumé météorologique des années 1927–1936 pour Genève et le Grand Saint-Bernard. [Meteorological summary for the years 1927–1936 for Geneva and the Great St. Bernard.] *Geneva, Observatory, Publications, Ser. M*, Fasc. 1–10, **1927–1936.** paging varies. Reprint from: *Archives des Sciences Physiques et Naturelles*, Geneva, 1927–1936. **DLC**—Include daily observations, monthly means and summaries. *Subject Headings:* **Mountain meteorology, Observational data, Geneva, Great St. Bernard, Alps.**

1928

2K–89 551.582(44):551.43

Besson, Louis, **Les stations d'altitude françaises.** [French high-level stations.] *Annales d'Hygiène publique, industrielle et sociale*, Paris, 6(6):1–20, June **1928.** 7 tables. **DLC**—A comparison of seasonal means at Ballon de Guebwiller (1394 m.), Puy de Dôme (1467) and Pic du Midi (2859) with low level stations, and a discussion of changes of climate with height. Includes: Temperature, air pressure, relative humidity, cloud, precipitation (including snow) and physiological effects. *Subject Headings:* **Mountain meteorology, Physiological climatology, France.**

2K-90 551.555(234.3)

Brückmann, W., **Beispiele der Gestalt des Stromfeldes der Luft in der Schweiz.** [Examples of the form of the streamline field in Switzerland.] *Schweizerische Meteorologische Zentralanstalt, Annalen, Anhang* 1b, **1928.** 5 p. 5 fig. **DWB**—After a brief discussion of streamlines in mountain valleys, author reproduces and discusses streamlines for: 1) Bise, April 18, 1924 (N'ly current penetrating valleys); 2) Nov. 1, 1924, 7h. (no definite current); 3–5) Feb. 15, 1925, 7, 14, 21h. (strong föhn). *Subject Headings:* **Mountain meteorology, Streamlines, Swiss Alps.**

2K–91 551.582:551.579.2(234.3)

de Rham, René, **Le climat des Alpes méridionales. Essai d'utilisation des divers éléments météorologiques pour l'évaluation des débits de la Haute Durance.** [The climate of the southern Alps. Attempt at the use of the various meteorological elements for the evaluation of the flow from the High Durance.] *La Météorologie*, 4:433–625, **1928.** 37 figs., plates, 2 maps, 88 tables. **DWB**—This exhaustive summary deals in detail with the part of France between the Rhone, Switzerland and the Mediterranean. Pt. I discusses data 1878–1916 of wind, temperature, cloud, precipitation, fog, snow, etc. Pt. II discusses hydrometry, Pt. III hydrometric observations 1921–1928 and Pt. IV includes numerous tables and charts representing the data. *Subject Headings:* **Mountain meteorology, Hydrology, France.**

2K–92 551.576.1(234.3)

Douglas, C. K. M., **Some Alpine cloud forms.** *Royal Meteorological Society, Quarterly Journal*, 54:175–177, **1928.** fig., 3 photos. Discussion p. 177–178. **MH-BH**—Discussion of origin of banner cloud on sharp peaks, e.g. Matterhorn (air drawn up by lee eddy), caps due to rising air on windward side (e.g. Dent Blanc and Mont Blanc de Courmayeur) and fog cascade. *Subject Headings:* **Mountain meteorology, Clouds, French Alps.**

2K–93 551.506.5(56)

Künne, Georg, **Die deutsche alpine Taurusexpedition 1927 (Ala Dagh in Zilizien). Wissenschaftliche Ergebnisse.** [The German alpine Taurus expedition 1927 (Ala Dagh in Cilicia). Scientific results.] *Petermann's Geographische Mitteilungen*, 74:273–276, **1928.** 8 photos, 2 maps. **DLC**—Ascents were made in July and August 1927 to a height of 3910 m. An account is given of barometric determination of heights and measurements of humidity from 2280 to 2480 m. *Subject Headings:* **Mountain meteorology, Humidity data, Taurus Mountains, Asia Minor.**

2K–94 551.521.2(234.3)

Lauscher, Friedrich, **Bericht über Messungen der nächtlichen Ausstrahlung auf der Stolzalpe.** [Report of measurements of nocturnal radiation on the Stolz Alps.] *Meteorologische Zeitschrift*, 45:371–375, **1928.** 2 figs., 6 tables. **DWB**—Observations with an Ångström pyrgeometer at Murau (Steiermark) 1160 m. Tables give hourly out-radiation in cal./cm²/min. on clear and overcast nights, means for different temperature groups and cloud amounts (mean 0.144 with cloud 0; 0.105 cloud 5–6; 0.021 cloud 10; 0.011 fog), discussion and comparison with Ångstrom's formula. *Subject Headings:* **Mountain meteorology, Terrestrial radiation, Austrian Alps.**

1929

2K–95 551.5:551.43

Baldit, Albert, **Météorologie du relief terrestre. Vents et nuages.** [Meteorology of terrestrial relief. Winds and clouds.] Paris, Gauthier-Villars, **1929.** 328 p. 128 figs., 2 tables. **DWB**—A detailed study of the passage of air over high ground, by upper air investigations and cloud studies. Chap. 1 deals with methods—kites, including ways of measuring inclination of wind to horizontal, aircraft, gliders (including cinema studies of flight of glider), pilot balloon in indifferent equilibrium, and studies with models. This chapter also includes meteorological methods of determining the vertical and horizontal extent of the influence of a mountain by observation of winds, temperatures, cloud and precipitation and theoretical calculation of air trajectories. Chap. 2 discusses the different modes of action of isolated mountains and ranges, stream lines, stationary eddies and the critical wind velocity of eddies carried by the wind, eddies with vertical axes on mountain slopes, descending winds below the crests, and the effect of wind in decreasing pressure at the summit. Slope and valley winds and the effect of rivers are also considered. In Chap. 3 cloud formation is discussed, with diagrams illustrating: ascending thermal winds without and with discontinuities, clouds of dynamic origin and clouds of turbulence. Chap. 4 gives some examples with sketches and poor photographs from many mountains—lenticular clouds, helm cloud, "table cloth" of Table Mountain, etc., banner and trail clouds. *Subject Headings:* **Mountain meteorology, Streamlines, Mountain winds, Clouds.**

2K–96 551.588.2

Büdel, Anton, **Zugspitzbahn-Versuche.** [Zugspitze railway investigations.] *Deutsches Meteorologisches Jahrbuch, Bayern*, 51–53, *Anhang E*, **1929–1931.** 30 p. 32 figs., 4 tables; 5 p. 18 figs., 13 plates; 36 p. 77 figs., 11 tables. **DWB**—A remarkably complete investigation of the diurnal variation of conditions on the west slope of Zugspitze between 1200 and 2800 m. by means of a kite meteorograph carried on the roof of a cabin of the mountain railway, completed by records of neighboring climatic stations and by free air data. A great amount of material is presented in time-height isopleths of various elements under different weather types. Pt. 3 includes isopleths of potential temperature, isostathms (lines of equal stability), an analysis of differences between mountain atmosphere and free air, and a discussion of the atmospheric stream lines, cold and warm air incursions, local heating, humidity, etc. *Subject Headings:* **Mountain meteorology, Vertical temperature gradient, Zugspitze, Germany.**

2K–97 551.594.7

Fuchs, J., **Die Sende- und Empfangsverhältnisse im Hochgebirge mit besonderer Berücksichtigung der atmosphärischen Störungen.** [Transmission and reception conditions in the high mountains, with special reference to atmospheric disturbances.] *Hochfrequenztechnik und Electroakustik*, Berlin, 34(3):96–101, **1929.** 5 figs. **DLC**—Observations of weather conditions made at Sonnblick Observatory (3106 m.) near Salzburg, Austria, are correlated with sending and receiving conditions. Disturbances due to precipitation in the vicinity (drizzle, light, moderate and heavy rain, graupel, light and heavy snowfall) are classified according to the type or tone of noise heard in the receiver. Conditions in the mountains are similar to those on the plains, but according to the author, the mountains are most suitable for research into sources of atmospheric disturbances. *Subject Headings:* **Mountain meteorology, Sferics, Radio transmission, Sonnblick Observatory, Austria.—M.R.**

2K–98 551.521 551.593.7

Holzapfel, Rupert, **Ergebnisse von Strahlungs- und Polarisationsmessungen auf dem Hochobir im Sommer 1927.** [Results of radiation and polarization measurements on the High Obir in the summer of 1927.] *Vienna, Akademie der Wissenschaften, Math.-Naturwiss. Klasse Sitzungsberichte*, 2a, 138:1–16, **1929.** 17 tables. **DLC**—Observations at 2160 m. with Michelson-Marten bimetallic actinometer, Ångström pyranometer and pyrgeometer and Cornu polarimeter are set out in tables of hourly values. Maximum radiation 1.460 cal./cm²/min. June 29, 12 h.; red intensity 0.780 Sept. 22, 11 and 12 h. Total heat on a horizontal surface calculated for various places 54 to 2040 m. height. Turbidity factor and influence of cloudiness calculated. Polarization (mean of 80 measurements of clear blue sky) 63%; it increases with increasing intensity of solar radiation and increasing elevation above horizon. *Subject Headings:* **Mountain meteorology, Radiation, Polarization.**

2K–99 551.576.11(234.3)

Köhler, Hilding, **Wolkenuntersuchungen auf dem Sonnblick im Herbst 1928.** [Cloud investigations on the Sonnblick in autumn 1928.] *Meteorologische Zeitschrift*, 46:409–420, **1929.** 7 figs., table. **DWB**—The investigations included: measurement of size of cloud elements, simultaneous water content, microscopical observations of fog particles on a fine thread, analysis of rime for chlorine (generally inappreciable; one observation gave 0.06 mg./liter). Drop size radius r is expressed as $n = 3(\log r - \log 8.859)/\log 2$, and frequency curves given (maximum between $n = 0$ and 1.1, corresponding to 8.8 to 11.2 μ). *Subject Headings:* **Mountain meteorology, Cloud physics, Sonnblick, Austria.**

2K–100 551.521.2(234.3)

Lipp, Hermann, **Beiträge zum Strahlungsklima der Zugspitze.** [Contributions to the radiation climate of the Zugspitze.] *Deutsches Meteorologisches Jahrbuch, Bayern*, 50:D1–49, **1928.** 28 figs., 51 tables. **DWB.** Summarized in: Voigts, Heinrich & Lipp, Hermann, **Beiträge zum Strahlungsklima der Zugspitze.** *Zeitschrift für angewandte Meteorologie*, 46:344–351, **1929.** tables. **DWB**—Gives a useful historical account of radiation measurements on mountains, followed by many detailed tabular summaries of intensity of direct solar radiation, annual variation and its causes, diurnal variation, maximum value (1.67 cal./cm²/min.) compared with other mountain stations, non-periodic variations, radiation in special wavelengths, heating effect and relations to weather type. Pt. 2 deals with diffuse heat radiation from the sky, including effect of cloud. An appendix gives observations during partial eclipse of June 29, 1927. *Subject Headings:* **Mountain meteorology, Radiation, Zugspitze, Germany.**

1930

2K–101 551.558.21:778.5

Abe, Masanao, **Local air current of Mt. Fuji, as observed by the motion of cloud by the aid of a cinematograph.** *Geophysical Magazine*, Tokyo, 3:45–58, **1930.** 9 figs., 3 plates, 2 tables. **DLC**—In

addition to quick-motion cinema films, stereoscopic photos were made by 2 cameras 500 m. apart. Positions and motions of 6 clouds on Oct. 6, 1928, are set out diagrammatically and heights (1.5–7.5 km.) and speeds (3–32 m./sec.) tabulated. Wind currents were also studied by means of a model of Mt. Fuji in a wind tunnel, giving some interesting wave motion. The plates show a stereoscopic view, experiments with model, and strips of cinema films. *Subject Headings:* **Mountain meteorology, Winds, Clouds, Japan.**

2K–102 551.552:551.43(54)

Banerji, S. K., **The effect of the Indian mountain ranges on air motion.** *Indian Journal of Physics*, 5(7):699–745, **1930.** figs. **DLC**—An analysis is given by which theoretical stream lines can be drawn over India; these agree with the observed flow at 0.5 km. Vertical motions are discussed, but the calculated rainfall over the Western Ghats (7600 inches) is many times too high. In reply to criticisms by S. R. Savur (*ibid.*, 7:389–392, 1932), some details are explained on p. 411–425, showing that the viscosity term is negligible. *Subject Headings:* **Mountain meteorology, Streamlines, Monsoons, India.**

2K–103 551.547:551.43

Ertel, Hans, **Die vertikale Druckverteilung in turbulenten Strömungen.** [The vertical pressure distribution in turbulent currents.] *Meteorologische Zeitschrift*, 47:222–227, **1930.** 24 equations. Also: Koschmieder, H. and Ertel, Hans, **Turbulenz und Druckniedrigung auf Bergstationen.** [Turbulence and lowering of pressure at mountain stations.] *Ibid.*, 49:116–118, 199–201, **1932.** 1 fig., 11 equations. **DWB**—In 1930 Ertel showed that the vertical distribution of pressure in a turbulent air stream is not static, the departure being a function of turbulence, and suggested that this might account for the lowering of pressure at mountain observatories in strong winds. This is criticised by Koschmieder, reply by Ertel. *Subject Headings:* **Mountain meteorology, Pressure, Turbulence.**

2K–104 551.577.51

§Hartmann, Wilhelm, **Über ein Niederschlagsgebiet geringer vertikaler Mächtigkeit im mitteldeutschen Bergland.** [On a rainfall area of small vertical depth in the central German mountain region.] *Germany, Reichsamt für Wetterdienst, Erfahrungsberichte, Sonderband*, 3:119–124, **1930.** 4 figs. **DWB**—Account of a flight from Hannover to Frankfurt, Nov. 18, 1931. A thin layer of dense cloud was observed over the mountains. The conditions giving rise to it are discussed. *Subject Headings:* **Mountain meteorology, Orographic rainfall, Germany.**

2K–105 551.577(234.3)

*Knoch, Karl and Reichel, E., **Verteilung und jährlicher Gang der Niederschläge in den Alpen.** [Distribution and annual variation of rainfall in the Alps.] *Berlin, Preussisches Meteorologisches Institut, Abhandlungen*, 9(6), **1930.** 84 p. 15 figs., 27 charts, colored map of rainfall, 18 tables. **DLC**—This very detailed study gives in tables and charts a mass of data of the monthly and annual precipitation in mm. and numbers of days, corrected to 1876–1910. Five types of annual variation are distinguished: summer rain, transition, equinoctial, French and high-level, and are explained by wind statistics and weather types. Variability is discussed on basis of figures for decades. Data for a number of stations above 3000 m. are included, up to 3850 m. (Galmenhorn). *Subject Headings:* **Mountain meteorology, Precipitation, Alps.**

2K–106 551.576.11

Köhler, Hilding, **Untersuchungen über die Wolkenbildung auf dem Pårtetjåkko im August 1928 nebst einer erweiterten Untersuchung der Tropfengruppen.** [Research on cloud formation on Pårtetjåkko August 1928, in addition to further research on drop grouping.] *Naturwissenschaftliche Untersuchungen des Sarekgebirges in Schwedisch-Lappland*, Vol. 2, *Meteorologie und Geophysik*, No. 2:77–128, **1930.** figs., 6 tables, 13 refs., numerous equations. **DWB**—(*Same item* as C–10 in March 1950 *Meteorological Abstracts.*) *Subject Headings:* **Cloud formation, Rain formation, Pårtetjåkko, Swedish Lapland.**

2K–107 551.501.9(234.3)

Mörikofer, Walter, **Die Forschungstation auf dem Jungfraujoch (3457 m.).** [The research station on the Jungfraujoch.] *Sonnblick-Verein, Jahresbericht*, 39:7–13, **1930.** 2 figs. **DWB**—Description of buildings only. *Subject Headings:* **Mountain meteorology, Mountain observatories, Jungfraujoch, Switzerland.**

2K–108 551.585.7:631.4

Senstius, M. W., **Studies on weathering and soil formation in tropical high altitudes.** *American Philosophical Society, Proceedings*, 69:45–97, **1930.** fig., 7 tables, 34 refs. **DWB**—Soil samples were

collected from 12 mountains in Java and Philippines, heights up to 3265 m. Analyses are given, and climatic control of soil formation discussed. Podsols were not found in high altitudes. *Subject Headings:* **Mountain meteorology, Soils, Java, Philippines.**

2K–109 551.506.5(235)

Smythe, Francis Sydney, **The Kangchenjunga adventure.** London, Gollancz, **1930.** 464 p. illus. **DLC**—This account of the unsuccessful attempt to climb the third highest mountain in the Himalayas includes a number of vivid descriptions of the weather, and photos of cloud, fog and snow. *Subject Headings:* **Mountain meteorology, Kangchenjunga, Himalayas.**

2K–110 551.582(749.1)

*von Ficker, Heinz, **Die meteorologischen Verhältnisse der Insel Teneriffa.** [The meteorological conditions of the island of Tenerife.] *Berlin, Akademie der Wissenschaften, Physik.-Math. Klasse, Abhandlungen*, No. 1, **1930.** 105 p. 15 figs., 36 tables, 6 full climatological summaries, 45 refs. **DLC**—A detailed summary based on 16 stations in the Canary Islands between sea level and 2367 m. The sections deal, mostly from the point of view of vertical variation, with pressure, winds, temperature, absolute and relative humidity, cloud, mist and haze, precipitation of all types, and disturbances. A valuable source of data. *Subject Headings:* **Mountain meteorology, Climatic data, Tenerife, Canary Islands.**

1931

2K–111 551.5:91.04(235)

*Alessandri, Camillo and Venturi-Ginori, Nello, **Relazioni scientifiche delle spedizione italiana De Filippi nell'Himalaia, Caracorum e Turchestan Cinese (1913–1914).** Ser. 1, Vol. 3, **Geofisica: meteorologia, aerologia e pireliometria.** [Scientific report of De Filippi's Italian expedition to the Himalaya, Karakoram and Chinese Turkistan. Geophysics: meteorology, aerology and pyrheliometry.] Bologna, **1931.** 19+565 p. 116 figs., 124 tables. **DLC**—This massive volume gives in Pt. 1 hourly results of surface (including actinometer) and upper air observations at Scardu (Baltistan, 35°18′N., 75°39′E., 2233 m.), Leh (Ladak, 34°10′N., 77°35′E., 3520 m.), Altipiano Depsang (Karakoram, 35°17′N., 77°58′E., 5362 m.). For comparison are hourly observations on Monte Rosa, Italy at heights from 1205–4560 m. Pt. II discusses the results in detail, including relations between pressure, temperature and altitude, semidiurnal pressure oscillation, air currents at different heights and radiation. *Subject Headings:* **Mountain meteorology, Climatic data, Himalayas.**

2K–112 551.552:551.43(43)

Baumann, G., **Strömungseinfluss des mitteldeutschen Gebirgsrandes und seine Bedeutung für die Flugmeteorologie dieses Gebietes.** [Influence of the central German mountain fringe on air currents and its importance for the aircraft meteorology of this region.] *Aus dem Archiv der Deutschen Seewarte, Hamburg*, 49(9), **1931.** 48 p. 8 figs., 4 tables, 16 plates, 16 refs. **DWB**—A detailed discussion of the modifications of wind direction, strength and steadiness in crossing the mountains, for different stream-flow directions, vertical velocity, squalliness, thunderstorm activity and vortices are related to certain wind types. If the wind is nearly parallel to the obstacle, it flows round (2-dimensional flow): if at right angles it flows over (3-dimensional). Appendix gives mean direction, force and "constancy" of different winds in summer and winter at a large number of places; data also represented by streamlines on orographic charts. *Subject Headings:* **Mountain meteorology, Aeronautical meteorology, Streamlines, Germany.**

2K–113 551.578.46(234.3)

Conrad, V. and Winkler, M., **Beitrag zur Kenntnis der Schneedeckenverhältnisse in den österreichischen Alpenländern.** [Contribution to knowledge of the snow-cover conditions in the Austrian Alps.] *Beiträge zur Geophysik*, 34:473–511, **1931.** 6 figs., 15 tables. **DWB**—The general duration of snow cover in days is given by $23+0.1\ h$ where h is height above M.S.L. in meters. This is modified by the aspect of the individual valleys. *Subject Headings:* **Mountain meteorology, Snow cover, Alps.**

2K–114 551.577.2(494)

Gautier, Raoul, **Mesures des chutes de pluie et neige au Grand Saint-Bernard. Deuxième note.** [Measurements of falls of rain and snow on the Great St.-Bernard. 2nd note.] *Geneva. Observatory, Publications, Ser. M*, Fasc. 3, **1931.** 7 p. 3 tables. **DLC**—First note in *Archives des Sciences physiques et naturelles*, 1922. p. 343–353. This extends data to 1928. Gives totals on old and new pluviometers, reduction factors and monthly tables of depths of rain and snow, 1917–1928. Mainly concerned with reduction. Precipitation around 3000–4000 meters recorded by totalisators is about 3 meters. *Subject Headings:* **Mountain meteorology, Rain, Snow, Great St. Bernard, Alps.**

2K–115 551.501.9:551.43

Hamberg, Axel, **Das meteorologische Observatorium auf dem Pårtetjåkko. Arbeiten des Pårtetjåkko Observatoriums unter besonderer Leitung einer K. Kommission.** [The meteorological observatory on the Pårtetjåkko.] *Naturwissenschaftliche Untersuchungen des Sarekgebirges in Schwedisch-Lappland*, 5, Lief. 1:1–88, **1931.** 35 figs., 2 plates, tables. Hamberg, Axel, **Ermittelung des Einflusses des terrestrischen Horizontes auf die Sonnenscheindauer.** [Evaluation of the influence of the terrestrial horizon on the sunshine duration.] *Ibid.*, p. 89–103. panoramic plate, 5 tables. **GB-MO**—Observations on the summit (2090 m.) began in 1895. A hut for an observatory was built in 1911 on a plateau at 1836 m. Difficulties of maintenance are discussed in detail and the activities described year by year. On Feb. 13–15, 1917, a hurricane moved stones weighing up to 34 kg. Instructions to observers, cost, determination of coordinates and instrumental equipment are described. The second paper describes the horizon of the sunshine recorder. *Subject Headings:* **Mountain meteorology, Mountain observations, Pårtetjåkko, Swedish Lapland.**

2K–116 551.524.31(54)

Jameson, H., **Temperature observations on Adam's Peak, Ceylon.** *Royal Meteorological Society, Quarterly Journal*, 57:296–300, **1931.** 2 figs. **MH-BH**—Description of controlled thermograph records in Jan. and Feb. on Adam's Peak at a height of 7360 ft. and Nuwara Eliya in a valley at 6170 ft. Adam's Peak showed a mean range from about 53–73°F. with a very flat minimum from 18 h. to 6 h. and a sharp rise to an exceptionally high maximum at 11 h. The early high temperature is attributed to converging rising winds, forming cloud after midday. Both maximum and minimum were higher than at Nuwara Eliya. *Subject Headings:* **Mountain meteorology, Temperature, Adam's Peak, Ceylon.**

2K–117 551.501.9

Jungfraujoch Hochalpine Forschungsstation. [Jungfraujoch high-Alpine investigation station.] Zurich, Orell Füssli, **1931.** 100 p. plates. **DLC**—Includes chapters on the organization of the observatory, climate of the Jungfraujoch, etc. Photos and plans show the laboratory, but the situation on a steep slope is not ideal for meteorological observations. *Subject Headings:* **Mountain meteorology, Mountain observatories, Jungfraujoch, Swiss Alps.**

2K–118 551.542.1 551.552:551.43

Little, D. M., **Some effects of California mountain barriers on upper air winds and sea-level isobars.** *Monthly Weather Review*, 59:376–380, **1931.** 4 figs. **DWB**—Abnormally steep pressure gradients in the reduced (sea level) charts appear over the Sierra Nevada and Tehachapi mountain barriers due to compression on windward and expansion on leeward sides. Upper winds at about 8000 ft. immediately over the barrier are up to 90 m.p.h. The pressure effect is shown on composite pressure charts of California, the special case of April 22, 1931, and in profiles of scalar and resultant velocity. *Subject Headings:* **Mountain meteorology, Pressure gradients, Winds, California.**

2K–119 551.577.51(234.3)

Maurer, J., **Die Gebiete höchster Jahresniederschläge im schweizerischen Alpenland.** [The regions of highest annual precipitation in the Swiss Alps.] *Beiträge zur Geophysik*, 32:346–352, **1931.** 4 figs., table. **DWB**—Fig. 1 shows distribution of precipitation (200 over 400 cm./year). Maxima occur in the southern high Alps of Wallis, the firn region of Jungfrau and the highest peak of Säntis. The relation to height is shown for various regions. Finally, the variations of the firn line on Titlis summit are described (2 photos). See also: Maurer, J., **Die Niederschlagsverteilung im schweizerischen Hochgebirge.** [The distribution of precipitation in the Swiss Alps.] *Beiträge zur Physik der freien Atmosphäre*, 15:102–106, **1929.** *Subject Headings:* **Mountain meteorology, Precipitation, Swiss Alps.**

2K–120 551.524.7(234.3)

Peppler, W., **Zur Frage des Temperaturunterschiedes zwischen den Berggipfeln und der freien Atmosphäre.** [On the question of the temperature difference between mountain summits and the free atmosphere.] *Beiträge zur Physik der freien Atmosphäre*, 17:247–263, **1931.** 22 tables, 14 refs. **DWB**—Zugspitze (2964 m.) is always colder than free air at same height in clear weather, by 2–3°C. in morning, 1–2° in afternoon. Difference decreases with increasing cloud. It increases with winds up to force 4 (Beaufort), then decreases. It is greatest with isothermal atmosphere or inversion and with northerly winds. At Säntis results are similar but difference is greatest with southerly winds. The negative difference is attributed to dynamical cooling by forced ascent. Special cases are examined. *Subject Headings:* **Mountain meteorology, Temperature, Zugspitze, Germany.**

2K–121 551.558.21(234.3)

Roschkott, A., **Ein Windbeobachtungsnetz im Sonnblickgebiet.** [A wind observation network in Sonnblick region.] *Sonnblick-Verein, Jahrbuch,* 40:34–39, **1931.** 6 figs. **DWB**—Description of a cooperative scheme of observations of wind direction and force in summer, 1931, organized by the author for 50 places around Sonnblick, and illustrations of air flow on July 15–16 during a cold air inbreak. *Subject Headings:* **Mountain meteorology, Streamlines, Sonnblick, Austria, Alps.**

1932

2K–122 551.541 551.551

Arakawa, H., **The effect of topography on the direction and velocity of wind II.** *Geophysical Magazine,* Tokyo, 5:63–68, **1932;** 7:9–18, 488–491, **1933. On the influence of topography on the microbarometric observations.** *Ibid.,* 5:223–236, **1932. DWB**—The first paper analyzes the stream functions over a mountain in the shape of a semi-ellipsoid rising from a flat plain, the results being expressed as wind-roses. Also discusses the effect which a vortex in the rear of a semi-cylindrical mountain would have on the wind over the ridge. The second paper discusses the large oscillations of the microbarograph on the summit of the volcano Mt. Huzi; these are partly due to oscillation in the crater and partly to wave motion in a surface of discontinuity above a mountain. *Subject Headings:* **Mountain meteorology, Streamlines, Pressure variations.**

2K–123 551.558.21:551.43

Ekman, V. W., **Über die Beeinflussung der Windbahnen durch Gebirge.** [On the influencing of wind tracks by mountains.] *Beiträge zur Physik der freien Atmosphäre,* 19:272–275, **1932.** fig. **DWB**—A general discussion of the dynamics of winds in mountain regions with special reference to the work of Th. Hesselberg and H. U. Sverdrup in 1914 (*see item* 2K–35 above). *Subject Headings:* **Mountain meteorology, Streamlines.**

2K–124 551.576.11

Isimaru, Yukiti, **On the mountain clouds.** *Meteorological Society of Japan, Journal, 2nd Ser.,* 10:334–344, **1932.** 4 plates. In Japanese, English summary p. 25–27. **DLC**—Describes investigations on Mt. Tukuba of annual and daily variation of frequency and height of mountain haze and clouds, relations to variations of vertical temperature, classification of cloud forms and estimates of size of droplets. Height shows great variation, maximum at midday and in summer. Dense clouds appear within 100 meters of temperature inversion. Cloud forms are shown on 24 photos and diagrams are given of air circulation. Size of droplets 5–150 microns, mean about 30. Photographs also include Brocken bow and mountain spectre and some "clouds" produced by blowing tobacco smoke over a model. *Subject Headings:* **Mountain meteorology, Clouds, Japan.**

2K–125 551.558.21

Kawano, M. and Kitazawa, S., **Comparison between the distribution of wind directions over the Hakone-range and that in the free atmosphere over Misima.** *Geophysical Magazine,* Tokyo, 6:69–78, **1932.** 3 figs., 3 tables. **DWB**—Wind data are for Hakoneyama, height about 1000 m. and pilot balloons at Misima 12 km. to S.W. Mountain winds show maxima from NE–ENE and SW–WSW, nearly perpendicular to the general trend of the range, but free air above 1000 m. shows only one maximum, from WSW. Data set out in detailed tables. *Subject Headings:* **Mountain meteorology, Upper air winds, Japan.**

2K–126 551.521.11:551.43(43)

Knoch, Karl, **Die Wintersonne des Hohen Harzes.** [The winter sun of the High Harz.] *Zeitschrift für Kurortwissenschaft,* 2(9):539–546, **1932.** fig., tables. **DWB**—A tabulation of the duration of sunshine in Dec.–Feb. at Brocken (1140 m.) compared with 5 stations at 572–56 m., showing the relatively large amounts at Brocken. *Subject Headings:* **Mountain meteorology, Sunshine duration, Brocken, Harz Mountains, Germany.**

2K–127 551.558.21

Lange, K. O., **Über Vertikalbewegungen der Luft in der Atmosphäre.** [On vertical movements of the air in the atmosphere.] *Rhön-Rossitten Gesellschaft e. V., Forschungsinstitut, Veröffentlichungen,* No. 5:25–43, **1932.** 32 figs., 4 refs. **DLC**—No-lift pilot balloons were liberated from aircraft at various heights above hilly country mainly near Wasserkuppe (950 m.) and followed with two theodolites. Tracks are given in plan and elevation. Numerous results are summarized under temperature gradient and wind speed. With winds of 1/2 m./sec. and large temperature gradient, movement is independent of contours. With stable stratification and light winds, flow is laminar; with stronger winds (8+m./sec.) only the main features are followed. With labile gradient and differential heating of the slopes there is a combination of contour winds and thermal winds. *Subject Headings:* **Mountain meteorology, Winds.**

2K–128 551.586:551.43 551.588.2:551.43

*Loewy, Adolf, **Physiologie des Höhenklimas.** [The physiology of high climates.] Berlin, J. Springer, **1932.** 414 p. **Das Hochgebirgsklima.** [The high mountain climate.] By Walter Mörikofer. p. 12–65. 9 figs., 14 tables, 40 refs. **DWB**—"Mountain climate begins at a height of a few hundred meters in Arctic, 1000 m. in temperate latitudes and 4000 m. in tropics." The memoir summarizes facts on vertical variation, mainly in the Alps, of composition of air (including nuclei), air pressure and density, solar radiation (midday intensity, daily variation, UV, terrestrial and atmospheric radiation), cloudiness and sunshine, fog and mountain cloud, temperature, humidity (vapor pressure, relative and "physiological" humidity, saturation deficit). Since the observed high relative humidity does not represent the physiological dryness of the air, it is calculated for the lung temperature of 37°C. The summary continues with precipitation and snowfall, wind conditions, bioclimatic warmth factors and cooling power, and atmospheric electricity (number of ions, conductivity, potential gradient). Finally the special characteristics of high mountain climate are generalized as a decrease with height of the static and an increase of the dynamic elements. Curative properties increase, especially on peaks, up to about 1800 m., but much above that the cold strong wind and intense UV radiation are dangerous. *Subject Headings:* **Mountain meteorology, Physiological climatology, Alps.**

2K–129 551.586:551.43

Mörikofer, Walter, **Die Vorzüge des Hochgebirgsklimas.** [The advantages of the high mountain climate.] *Praxis*, No. 5, 4 Feb. **1932.** 7 p. **GB-MO**—Author defines "high mountain climate" as that suitable for healing and sport between 1200 and 1800 m., characteristically found in the Alps. Advantages—decreased pressure leading to deep breathing, increased solar radiation especially in UV, light winds giving small cooling power, dryness of the air. Popular account. *Subject Headings:* **Mountain meteorology, Physiological climatology, Alps.**

2K–130 551.588.2:551.43

Mörikofer, Walter, **Probleme der Hochgebirgsmeteorologie.** [Problems of high mountain meteorology.] *Schweizerische Naturforschende Gesellschaft, Verhandlungen*, 1932:282–293. Bern, **1933.** Reprint available. **DLC**—A review of knowledge of mountain meteorology with special reference to Jungfraujoch. Decreases of pressure, density and vapor pressure with height are well known; changes of iodine, ozone, dust and nuclei less so. There are many problems of atmospheric electricity. More knowledge is required of precipitation at great heights and of general and local winds. A long-year periodicity of wind velocity is of great interest. Temperature, cooling power, radiation and sunshine are briefly discussed. *Subject Headings:* **Mountain meteorology, Jungfraujoch, Switzerland, Alps.**

2K–131 551.508.54

Mt. Washington Observatory. *American Meteorological Society, Bulletin*, 13(12):230–231, Dec. **1932. MH-BH**—Mainly a brief account of a heated anemometer installed on Mt. Washington. *Subject Heading:* **Anemometers.**

2K–132 551.515.8:551.43(52)

§Nisimura, D., **On the surface of discontinuity due to the mountain ranges.** *Geophysical Magazine*, Tokyo, 6:393–400, **1932.** 5 figs., 2 tables. **DWB**—In Kwanto district of Japan a line of discontinuity extends NW–SE across Tokyo while the warm sector of a cyclone is passing, due to the barrier formed by the range against a SW wind. As this front sways to and fro, sudden jumps of temperature occur. Illustrated by synoptic and wind charts. *Subject Headings:* **Mountain meteorology, Cyclones, Fronts, Japan.**

2K–133 551.521.64

Priebsch, Josef and Steinmaurer, R., **Ganzjährige Registrierbeobachtungen der kosmischen Ultrastrahlung auf dem Hohen Sonnblick (3106 m.).** [Whole year recorded observations of cosmic radiation on the high Sonnblick (3106 m.).] *Beiträge zur Geophysik*, 37:296–314, **1932.** 7 figs., tables, 16 refs. **DWB.** See also: *Vienna, Akademie der Wissenschaften, Math.-Naturwiss. Klasse, Anzeiger*, No. 13:11–113, **1932. DLC**—Observations 1929–30 reduced to 520.5 mm. pressure gave 8.00 and 6.13 J; correlations with pressure 0.6–0.9. *Subject Headings:* **Mountain meteorology, Cosmic radiation, Sonnblick, Austria.**

2K–134 551.521.11(436)

Roschkott, Alfred, **Die Sonnenscheinverhältnisse auf dem Sonnblick.** [Sunshine conditions on the Sonnblick.] *Sonnblick-Verein, Jahrbuch*, 41:10–17, **1932.** 5 figs., 4 tables. **DWB**—Table gives mean monthly duration etc. 1887–1932; annual and daily variation are discussed. *Subject Headings:* **Mountain meteorology, Sunshine duration, Sonnblick, Austria.**

2K–135 551.578.46(234.3)

Schinze, G., **40jährige Mittel der Schneehöhe auf der Schneekoppe und ihre Beeinflussung durch das Auftreten von arktischen und sub-tropischen Luftmassen.** [40-year mean of depth of snow on the Schneekoppe and its influencing by the occurrence of arctic and sub-tropical air masses.] *Zeitschrift für angewandte Meteorologie*, 49:289–296, **1932.** 2 figs., table. **DWB**—Table and figure give daily means of depth of snow cover on Schneekoppe (maximum 98.7 cm. March 17; below 1 cm., May 30 to Sept. 23). Fig. 2 gives probability of occurrence of snow cover of 2, 25 and 100 cm. on any day. *Subject Headings:* **Mountain meteorology, Snow cover, Schneekoppe, Riesen Gebirge, Germany.**

2K–136 551.577.51

Steinhauser, Ferdinand, **Ergebnisse neuerer Beobachtungen über die Niederschlagsverhältnisse im Sonnblickgebiet.** [Results of recent observations of the precipitation conditions in the Sonnblick region.] *Sonnblick-Verein, Jahrbuch*, 41:18–31, **1932.** 6 figs., 8 tables. **DWB**—Precipitation measurements 1891–1932 show a progressive decrease (1891–1900, 1788 mm., 1923–32, 1392 mm.), not shared by the valley, which may be real. The precipitation wind-rose is discussed and the present installation of 6 totalisators described. Measurements with these since 1927 are tabulated and compared, and the variation of precipitation with height examined. Precipitation increases to over 3500 m. height. *Subject Headings:* **Mountain meteorology, Precipitation, Sonnblick, Austria.**

2K–137 551.524.31:551.571.31:551.573(84)

Stenz, E., **Über den täglichen Verlauf der Temperatur, Feuchtigkeit und Verdunstung auf der bolivianischen Hochebene in Oruro (3703 m.) nach R. Kozlowskis Beobachtungen in den Jahren 1917–1919.** [On the diurnal variation of temperature, humidity and evaporation on the Bolivian plateau of Oruro (3703 m.) from R. Koslovski's observations in the years 1917–1919.] *Meteorologische Zeitschrift*, 49:19–30, **1932.** 8 tables, 16 equations. **DWB**—Includes diurnal variation of temperature and harmonic components, annual variation (maxima Feb.–March, Nov., minima July, Jan.), hourly means of relative humidity and vapor pressure and harmonic components, discussion of relations between temperature, relative humidity and vapor pressure, and diurnal variation of calculated evaporation with harmonic components. *Subject Headings:* **Mountain meteorology, Temperature, Humidity, Evaporation, Bolivia.**

2K–138 551.524.31:551.554.31(234.3)

Wagner, A., **Der tägliche Luftdruck- und Temperaturgang in der freien Atmosphäre und in Gebirgstälern.** [The diurnal variation of pressure and temperature in the free air and in mountain valleys.] *Beiträge zur Geophysik*, 37:315–344, **1932.** 6 figs., 4 tables. German and English summaries p. 315–316. **DWB**—The diurnal pressure variation in summer at Alpine summit stations up to the level of Mt. Blanc is evaluated by harmonic analysis. From the results the diurnal variation of temperature at various heights is calculated. The calculated *austausch* coefficient increases, then decreases, with height. The diurnal temperature wave decreases with height more gradually over the plains than in mountains, giving a pressure gradient valley-plains by day and plains-valley by night. *Subject Headings:* **Mountain meteorology, Pressure variations, Alps.**

1933

2K 139 551.501.9:551.43

Fontserè y Riba, Eduardo, **Les estacions meteorològiques de muntanya fundades per la Generalitat amb motiu de l'any polar 1932–1933.** [The mountain meteorological stations founded by the Government of the State for the Polar Year 1932–1933.] *Societat Catalana de Ciències Fisiques, Químiques i Matemàtiques, Memories*, 1(5):277–307, **1933.** 3 figs., 8 plates. In Catalonian, French summary p. 305–307. **MH-BH**—Descriptions and photographs of stations at Montserrat (41°36′N., 1°49′E., 1236 m.) and Montseny (41°47′N., 2°26′E., 1713 m.) and some cloud photos. *Subject Headings:* **Mountain meteorology, Mountain observatories, Spain.**

2K–140 551.558.21:551.43

Georgii, Walter, **Influence des montagnes sur le vent (1ère et 2ème communications).** [Influence of mountains on the wind. (1st and 2nd communications).] *La Météorologie*, 9:105–116, **1933.** 4 figs., tables. **Études sur le vent orographique.** [Studies on orographic winds.] *Ibid.*, p. 122–127, **1933. DWB**—Soundings with kites and balloons show that the influence of mountains on winds is about 0.29 × height of mountains, varying with wind direction and temperature lapse. The second paper shows the horizontal range of influence of a mountain in relation to its height. If slope of mountain from crest to foot is $\lambda°$ and angle of range of influence of $\beta°$, then generally $\beta = \lambda/2$. *Subject Headings:* **Mountain meteorology, Winds.**

2K–141 551.506.5(238)

Martinez, Nicolás G., **Exploraciones en los Andes ecuatorianos. Chimborazo, Carihuairazo, Quilindaña, Iliniza.** [Explorations in the equatorial Andes.] *Quito, Observatory, Publicaciones, Sec. Geof.*, **1933.** 125 p. plates. **GB-MO**—Mostly descriptions of ascents, but gives temperatures on Chimborazo Dec. 26–July 5, 1879–80 (−6.1 at 4351 m., −9.4 at 6272 m.). Observations also quoted on April 21, 1906 and Jan. 19–20, 1911 (−4 to −5°C. above 6000 m.). *Subject Headings:* **Mountain meteorology, Fragmentary climatic data, Andes, Ecuador.**

2K–142 551.501.9

Monahan, Robert S. and Pagliuca, Salvatore, **The Mount Washington Observatory.** *American Geophysical Union, Transactions*, **1933.** p. 85–88. **MH-BH**—History of the founding of the Observatory; full observations began Nov. 12, 1932. Accommodation, communications, regular meteorological observations and special studies of frost, solar and sky radiation, upper air (including effect of mountain on passing air), aurora, atmospheric electricity, radio, are listed. *Subject Headings:* **Mountain meteorology, Mountain observation, Mount Washington Observatory, New Hampshire.**

2K–143 551.578.46:796

Peppler, Albert, **Schneedecke und Schilauf im Schwarzwald.** [Snow cover and skiing in the Black Forest.] *Deutsches Meteorologisches Jahrbuch, Baden*, 65:92–108, **1933. GB-MO.** figs., tables. **Schneeverhältnisse und Schilauf im Schwarzwald.** [Snow conditions and skiing in the Black Forest.] *Zeitschrift für angewandte Meteorologie*, 51:352–360, **1934. DWB**—Analysis of snow records from 35 stations for over 30 years and comparison with other mountain areas in Germany. Tables give average numbers of days with snow depths of 10, 20, 30, 40 cm. or more, and snow reliability diagrams. *Subject Headings:* **Mountain meteorology, Snow cover, Skiing, Black Forest, Germany.**

2K–144 551.501.9:551.43

Roschkott, Alfred, **Die Höhenobservatorien im internationalen Wetterdienst.** [High level observatories in the international weather service.] *Sonnblick-Verein, Jahrbuch*, 42:51–53, **1933.** fig. **MH-BH**—Charts and lists high-level synoptic stations in Europe. At the time there were 11 above 2000 m. (including Tenerife). *Subject Headings:* **Mountain meteorology, Mountain observatories, Europe.**

2K–145 551.571.4(234.3)

Schmauss, August, **Verhalten der relativen Feuchtigkeit auf der Zugspitze.** [Conditions of relative humidity on the Zugspitze.] *Deutsches Meteorologisches Jahrbuch, Bayern*, 55:C1–19, **1933.** 35 figs., 6 tables. **GB-MO**—Relative humidity undergoes rapid irregular fluctuations without change of temperature, so that a daily variation can hardly be distinguished. The changes are related to mountain winds and in winter have no relation to changes on the plain. Relation to wind direction and föhn is also discussed. A number of hygrograph and thermograph records are reproduced. *Subject Headings:* **Mountain meteorology, Humidity, Zugspitze, Germany.**

2K–146 551.58:551.43

Steinhäusser, Hans, **Zusammenhänge zwischen Windrichtung und -Stärke, relativer Feuchtigkeit, Wolkenhöhe und Sicht nach Beobachtungen von Bergstationen.** [Relation between wind direction and force, relative humidity, cloud height and visibility from observations at mountain stations.] *Beiträge zur Physik der freien Atmosphäre*, 20:234–260, **1933.** 3 figs., 16 tables, 25 refs. **DWB**—A summary of observations at Taunus, Wasserkuppe, Black Forest, and Brocken, giving wind roses of speed, relative humidity, cloud height and visibility, and a discussion with correlations between cloud height and visibility. *Subject Headings:* **Mountain meteorology, Europe.**

2K–147 551.578.46(234.3)

Steinhauser, Ferdinand, **Schneehöhenmessungen am Sonnblick und im Sonnblickgebiet.** [Snow depth measurements on Sonnblick and in the Sonnblick region.] *Sonnblick-Verein, Jahrbuch*, 42:43–50, **1933.** 3 figs., 5 tables. **DWB**—Snow depths at 6 stations 1600–2875 m. and some valley stations are tabulated, monthly for 1927–1933/4, and discussed with dates of beginning and end of snow cover. *Subject Headings:* **Mountain meteorology, Snow cover, Sonnblick, Austria, Alps.**

2K–148 551.501.9:551.43(744)

Towle, Philip and Brooks, Edward M., **New weather station at Mt. Wachusett.** *American Meteorological Society, Bulletin*, 14(4):116, April **1933. MH-BH**—Brief account of a station on the isolated 2018 ft. peak in central Massachusetts for the International Polar Year. *Subject Headings:* **Mountain meteorology, Mountain observatories, Mount Wachusett, Massachusetts.**

2K–149 551.582(58)

von Ficker, Heinrich, **Bemerkungen über das Klima der Pamirgebiete. (Einige Ergebnisse der Alai-Pamir Expedition 1928.)** [Remarks on the climate of the Pamir region. (Some results of the Alai-Pamir Expedition, 1928.)] *Meteorologische Zeitschrift*, 50:81–87, **1933.** fig., tables. **DWB**—The severe climate of this desert plateau 3800–4800 m. high is represented by observations of summer temperature at Karakul (mean July–Aug. 8.1°C.), and Alai valley (10°C.) and summer precipitation at 5 stations. Pamirski Post (3912 m.) in a valley is a mild oasis, not representative. Conditions in the Ice Age are also discussed. *Subject Headings:* **Mountain meteorology, Pamirs, U.S.S.R.**

1934

2K–150 551.501.9:551.43

Bjerknes, J. and others, **Memorandum on the importance of meteorological mountain observatories with special reference to the new observatory on Mount Washington.** *American Meteorological Society, Bulletin*, 15(4):93–94, April **1934.** **MH-BH**—Emphasizes importance of mountain stations in frontal meteorology owing to increased frontal contrast up to 6 km., and appeals for a mountain network in U. S., and continuation of observations on Mt. Washington. *Subject Headings:* **Mountain meteorology, Mountain observatories.**

2K–151 551.585.7

Büdel, Anton, **Die Bergatmosphäre.** [The mountain atmosphere.] *Notgemeinschaft der deutschen Wissenschaft, Deutsche Forschung*, Berlin, 21, II:80–109, **1934.** 47 figs. **DLC**—Observations were taken in 1927–28 with a meteorograph on the roof of the cabin of the Zugspitze railway from Obermoos to Wettersteinkamm. These, with upper air data, give a detailed structure of the diurnal variation of temperature and density under various conditions including cold waves, and lead to a schematic picture of the progress of a cold wave. The onset of a mass of warm air, wind structure and humidity gradient are also discussed. (*See also item* 2K–96 above.) *Subject Headings:* **Mountain meteorology, Cold waves, Zugspitze, Germany.**

2K–152 551.58(237)

Fergusson, S. P., **Aerological studies on Mount Washington.** *American Geophysical Union, Transactions*, Pt. 1:114–117, **1934.** 2 figs., table. **DWB**—Summarizes results of observations of temperature and wind at summit (1913 m.) and in free air by kite or aircraft at same height and up to 125 m. above summit. Temperature difference depends on wind. The acceleration of wind over summit was confined to a layer of about 100 m. *Subject Headings:* **Mountain meteorology, Aerological studies, Mount Washington, New Hampshire.**

2K–153 551.501.9:551.521

†Götz, F. W. Paul, **Tätigkeit des Lichtklimatischen Observatoriums Arosa 1931–1934.** [Work of the radiation-climate Observatory of Arosa, 1931–1934.] *Naturforschenden Gesellschaft Graubündens, Jahresbericht*, 72, **1933–34.** 10 p. 3 plates, 44 refs. **DLC**—A brief description of the scheme of observations of radiation of different wave lengths at a height of 2040 m. Includes a list of publications by the author in 1931–34 (mainly concerned with ozone) in continuation of list published in *ibid.*, 69:150, 1931. *Subject Headings:* **Mountain meteorology, Solar radiation, Arosa, Switzerland.**

2K–154 551.594.11:551.43

Grenet, G., **Le champ électrique au sommet du Puy de Dôme.** [The electric field on the summit of the Puy de Dôme.] *Puy de Dôme, Institut et Observatoire de Physique du Globe, Bulletin*, No. 7:3–8, **1934.** 4 figs., table. **MH-BH**—Table gives hourly observations in v./m. of potential gradient on summit (1440 m.), 1928–32. Normal hourly variation is large in winter (140–230 v./m.), small in summer (125–175 v./m.). *Subject Headings:* **Mountain meteorology, Potential gradient, Puy de Dôme, France.**

2K–155 551.506.9(09)(44)

Humbert, Pierre, **Documents météorologiques anciens concernant la région du Mont-Blanc.** [Ancient meteorological documents concerning the region of Mont Blanc.] *La Météorologie*, 10:278–294, **1934.** **DWB**—A collection of extracts from parish registers, etc. from 1736–1861, describing various weather phenomena, avalanches etc. *Subject Headings:* **Mountain meteorology, Mont Blanc, France.**

2K–156 551.501.9:551.43

Mossman, R. C., **Argentine new high-level meteorological observatory.** *Royal Meteorological Society, Quarterly Journal*, 60(257):396, Oct. **1934.** photo. **MH-BH**—Description with photo of observatory at 4000 m. in Andes at Cristo Redentor, 32°49′S. 70°5′W. *Subject Headings:* **Mountain meteorology, Mountain observatories, Argentina.**

2K–157 551.508.77

Pers, R., **De l'influence du relief sur les précipitations en haute-montagne. Premiers résultats expérimentaux de stéréopluviométrie.** [On the influence of relief on the precipitation on high mountains. First experimental results of stereopluviometry.] *La Météorologie*, 10:473–475, **1934.** plate, 4 figs., 2 tables. **DWB**—Illustrates a "vectopluviometer," which is a collection of 5 raingages with one horizontal and 4 vertical openings, and a "stereopluviometer" with an inclined orifice to represent the slope of the ground. These are designed to obtain true rainfall amounts on exposed mountain slopes. Comparisons of records with those of an ordinary gage are given. *Subject Headings:* **Mountain meteorology, Rain gages.**

2K–158 551.558.21(234.3)

Roschkott, A., **Der Wind auf Berggipfeln und in der freien Atmosphäre. Verallgemeinerte Windrosen für die freie Atmosphäre.** [The wind on mountain summits and in the free atmosphere. Generalized wind roses for the free atmosphere.] *Meteorologische Zeitschrift*, 51:374–377, **1934.** 3 figs., tables. **DWB**—Resultant winds from different directions on Sonnblick (3100 m.) Obir (2140 m.) and Schöckl (1430 m.) are compared with winds in free air at same heights from pilot balloon ascents. After correction for selective days of pilot balloon ascents, generalized free air wind roses are constructed. *Subject Headings:* **Mountain meteorology, Upper air winds, Wind roses, Austrian Alps.**

2K–159 551.58(235)

Ruttledge, Hugh, **Everest 1933.** London, Hodder and Stoughton, **1934.** 390 p. plates and maps. **DWB**—This volume includes a systematic weather record on the expedition (p. 337–349) and a discussion of the meteorology of the Himalayas (p. 350–377). (*See item* 2K–168 below.) *Subject Headings:* **Mountain meteorology, Mount Everest, Himalayas.**

2K–160 551.582(236)

Scaetta, H., **Le climat écologique de la Dorsale Congo-Nil (Afrique centrale équatoriale.)** [The ecological climate of the Congo-Nile watershed (Equatorial Central Africa).] *Institut Royal Colonial Belge, Mémoires*, 3, **1934.** 335 p. illus. **NN**—This study of the solar radiation, insolation, clouds, temperature, wind, evaporation, humidity, condensation, rainfall and bioclimatic zones of the mountainous "spine" of Africa includes data for a station on Karisimbe (1⅛°S., 29½°E., 4506 m.) and contains much valuable material on mountain meteorology in the tropics. *Subject Headings:* **Mountain meteorology, Ecology, Africa.**

2K–161 551.58(237)

Schell, Irving I., **Differences between temperatures, humidities and winds on the White Mountains and in the free air.** *American Geophysical Union, Transactions*, Pt. 1:118–124, **1934.** 4 figs., 5 refs. **DWB**—Observations on Mt. Washington (1915 m.), Mt. Lafayette (1250 m.) and other lower stations are compared with aircraft data. Lapse in free air is greater than along slopes. Temperature difference increases with elevation. Relative humidity is greatly influenced by mountain and valley winds and is low in morning but high in afternoon. *Subject Headings:* **Mountain meteorology, Mount Washington, New Hampshire.**

2K–162 551.524.3(234.3)

Schmauss, August, **Der Gang des Winters auf der Zugspitze.** [The course of winter on the Zugspitze.] *Deutsches Meteorologisches Jahrbuch, München*, 56:D1–10, **1934.** 17 figs., 11 tables. **GB-MO**—Gives frequencies of dates of coldest days, of extreme maxima and minima, and of daily means, intervals between extremes, severity of winters, frequencies of NW and SE winds, relations of temperature and pressure, and secular variations, based on observations 1901–1933. *Subject Headings:* **Mountain meteorology, Temperature, Zugspitze, Germany.**

2K–163 551.58:551.43:6

Schmidt, Wilhelm, **Hochgebirgsklima und Technik.** [High mountain climate and technology.] *Naturwissenschaften*, 22:381–384, **1934.** refs. **DLC**—Increasing use of mountains makes a knowledge of their climate more important. Discusses applications to hydroelectricity, mountain roads, air travel and health. *Subject Headings:* **Mountain meteorology, Applied climatology.**

2K–164 551.584.3(234.3)

Schmidt, Wilhelm, **Observations on local climatology in Austrian mountains.** *Royal Meteorological Society, Quarterly Journal*, 60:345–351, **1934.** 4 figs. Discussion p. 351–352. **DWB**—A description of microclimatic work with thermographs and Assmann psychrometers at peak and valley stations up to Gstettneralm (1270 m.) and Sonnblick (3106 m.). Includes a famous section through a narrow valley to show inversion of 26–28°C. There is a summary of phenological work. *Subject Headings:* **Mountain meteorology, Microclimatology, Austrian Alps.**

2K–165 551.524.36(234.3)

Steinhauser, Ferdinand, **Zur Kenntnis der Extremtemperaturen in den Ostalpen. Häufigkeiten und Mittelwerte der Extremtemperaturen auf dem Sonnblick (3106 m.), auf dem Obir (2044 m.), in Bucheben (1203 m.), in Kremsmünster (384 m.).** [On the knowledge of extreme temperatures in the eastern Alps. Frequencies and mean values of extreme temperatures on the Sonnblick, Obir, in Bucheben, in Kremsmünster.] *Sonnblick-Verein, Jahrbuch*, 43:43–50, **1934.** 3 tables. **DWB**—Gives monthly means, standard deviations and extremes of daily maxima and minima. *Subject Headings:* **Mountain meteorology, Temperature extremes, Austrian Alps.**

2K–166 551.501.9:551.43(09)(73)

†Stone, Robert G., **The history of mountain meteorology in the United States and the Mount Washington Observatory.** *American Geophysical Union, Transactions*, **1934.** p. 124–133. 57 refs. **DWB**—A valuable study with exhaustive bibliography, beginning with the first series on Mt. Washington 1853–59, Pike's Peak (4311 m., 1870–1894). *Subject Headings:* **Mountain meteorology, Mountain observatories, History of meteorology, United States.**

2K–167 551.501.9(234)

Talman, C. F., **Europe's mountain weather stations.** *American Meteorological Society, Bulletin*, 15(11):269, Nov. **1934.** **MH-BH**—Brief reference to observatories on Hohenpeissenberg, Great St. Bernard, Schneekoppe, Mt. Blanc, Monte Rosa, etc. *Subject Headings:* **Mountain meteorology, Mountain observatories, Alps.**

2K–168 551.506.5(235)

Wager, L. R., **The weather.** (In Ruttledge, Hugh, **Everest 1933.** London, Hodder and Stoughton, **1934.** p. 337–351. 4 photos, plates, table.) **DWB**—The failure of the 1933 expedition to reach the summit was due to early arrival of the monsoon. The general weather is described on the march from Darjeeling to the base camp, at and above the latter from April 17 until the beginning of the SW monsoon, and during the monsoon in June. Comparative minimum temperatures are tabulated up to 21,000 ft. There are four excellent cloud photos. *Subject Headings:* **Mountain meteorology, Mount Everest, Himalayas.**

1935

2K–169 551.551:629.13

Baldit, A., **Les perturbations dues au relief terrestre et l'aviation.** [Perturbations due to terrestrial relief and aviation.] *La Météorologie*, **1935.** 11:267–312, **1935.** 12 figs. **DWB**—Pt. 4, p. 302–306, deals briefly with the effects of passing from a plain to mountains during approach of a front. Pt. 5 discusses aircraft above mountains and valleys, the turbulence set up by and to leeward of mountains, and the effect on cloudiness. *Subject Headings:* **Mountain meteorology, Aeronautical meteorology.**

2K–170 551.501.9:551.43

Blue Hill Observatory fifty years old. Reprint from: *Harvard Alumni Bulletin*, 37(19):584–594, **1935.** 4 photos. **DLC**—Account of celebrations, and personal contributions by H. H. Clayton, S. P. Fergusson, Prof. McAdie, L. A. Wells, O. L. Fassig, H. H. Kimball, Prof. Shapley, S. S. Drury, J. Woodbury, G. H. Noyes and C. F. Brooks. *Subject Headings:* **Mountain meteorology, History of meteorology, Blue Hill Observatory, Massachusetts.**

2K–171 551.521.11(234.3)

Garnett, Alice, **Insolation, topography and settlement in the Alps.** *Geographical Review*, 25:601–617, **1935.** 12 figs., table. **DWB**—Describes a method of calculating insolation in a mountain area, and examples of mountain shadow areas. Maps of calculated time and intensity are given near Visp, Canton of Valais, and Val di Marebbe, Italian Tyrol. Effect on land utilization discussed. Diurnal variation of energy received at selected stations at 1300–1500 m. is set out in cal./cm²/min. *Subject Headings:* **Mountain meteorology, Insolation, Alps.**

2K–172 551.521.31(47)

Kusmin, P. P., **Priamaia solnechnaia radiatsiia v gornom zeravshchanskom raïone.** [Direct solar radiation in the mountainous district of Zeravshan.] *Zhurnal Geofiziki*, 5:222–236, **1935.** 5 figs., 6 tables. English summary p. 236. **DLC**—Observations in 1933 at Kazan Temire (39°9′N., 68°58′E., 3710 m.) and other stations. Maximum radiation recorded 1.58 cal. (sun height 57.7°). Maximum often 1–2 hours before noon. At high levels the radiation depends only on the water vapor; at lower levels also on amount of dust. The effect of solar heat on ice melting is also discussed. *Subject Headings:* **Mountain meteorology, Solar radiation, U.S.S.R.**

2K–173 551.586(234.3)

Mörikofer, Walter, **Klimatologische Einflüsse des Hochgebirges.** [Climatic influences in the high mountains.] *Deutsche Gesellschaft für innere Medizin, Kongress Wiesbaden, Verhandlungen,* **47:501–508, 1935.** 4 figs. Reprint available. **DLC**—A general address on Alpine climates above 1200 m.—effect of decreased air density, increased cooling power of air, intensity and duration of sunshine, dryness. Climate highly favorable for curative purposes by toning up bodily functions. *Subject Headings:* **Mountain meteorology, Physiological climatology, Alps.**

2K–174 551.524.35(234.3)

Peppler, W., **Zur Kenntnis starker Kälteeinbrüche in den Hochalpen.** [On the knowledge of severe cold inbreaks in the high Alps.] *Zeitschrift für angewandte Meteorologie,* **52:148–154, 1935.** 5 tables. **DWB**—An investigation of large falls of temperature at central European high-level stations in relation to wind direction. At Säntis the mean duration of fall was 31 hours. *Subject Headings:* **Mountain meteorology, Cold waves, Alps.**

2K–175 551.524.7(237)

Schell, Irving I., **Free-air temperatures from observations on mountain peaks with application to Mt. Washington.** *American Geophysical Union, Transactions,* Pt. 1:126–141, **1935.** 6 figs., 14 tables, 15 refs. **DWB**—Observed differences of temperature and lapse rates are discussed in relation to wind velocity and air-mass type. Using these data, free air temperature can be obtained from mountain observations within about 1°C. *Subject Headings:* **Mountain meteorology, Upper air temperatures, Mount Washington, New Hampshire.**

2K–176 551.501.9:551.43(914)

Selga, Miguel, **Mountain meteorology in the Philippines.** (**Meteorological Note No. 28.**) *Meteorological Bulletin,* Manila, 1933:267–279, **1935.** 55 refs. **GB-MO**—Descriptions of sites and conditions of 19 high-level stations, the most important of which is Baguio (**1432** m.) where a 24-hour rainfall of 1168 mm. was recorded on July 15, 1911. There are also notes of weather on Apo, Davao (2929 m.), the highest mountain in the Philippines. *Subject Headings:* **Mountain meteorology, Mountain observatories, Philippines.**

2K–177 551.557 551.553.4

Travniček, F., **Die wahre Windverteilung auf den europäischen meteorologischen Hochstationen.** [The true wind distribution at the European high-level meteorological stations.] *Beiträge zur Physik der freien Atmosphäre,* 23:5–15, **1935.** 2 figs. **DWB**—A discussion of the wind observations at 20 European high-level stations, with wind roses and secular change leading to deductions about the secular variation of turbulence. *Subject Headings:* **Mountain meteorology, Winds, Europe.**

1936

2K–178 551.521.16

Agricola, A., **Ein Beitrag zum Strahlungsklima der Zugspitze (2962 m.).** [A contribution to the radiation climate of the Zugspitze.] *Meteorologische Zeitschrift,* 53:343–346, **1936.** 4 figs. **DWB**—With the help of a calibrated photocell with spectral sensitivity from yellow to UV, recordings were made on Zugspitze March to June. Some specimen records are reproduced showing intensity of illumination in klx in different months and with different cloud amounts and types. Mean maximum 120, March through May, slightly less June. *Subject Headings:* **Mountain meteorology, Illumination intensity, Zugspitze, Germany.**

2K–179 55:551.506.5:551.586.61(08)(57)

Akademiia Nauk, SSSR i Vsesoiuznyĭ Institut Eksperimental'noĭ Meditsiny, **Trudy El'bruskoĭ Ekspeditsii 1934 i 1935 g.** [Reports of the Elbrus Expedition 1934 and 1935.] Moscow, **1936.** 516 p. numerous figs., tables and refs. English summaries. (Akademiia Nauk, SSSR, Komissiia po izucheniiu stratosfery, Tom II.) **DLC**—A list of the contents of this volume is given in *Meteorological Abstracts, item* 2.1–3, January 1951. Abstracts of some of the papers have appeared as follows: *Item* 2.3–26; Konstantinova-Shlesinger, M., **Fliuorestsentnyĭ metod opredeleniia soderzhaniia ozona v vozdukhe.** [Fluorescent method of determination of the ozone content of the air.]

Item 2.4–93: Rodionov, S., Pavlova, E. and Stupnikov, N., **Izmerenie korotkovolnogo kontsa solnechnogo spektra metodom schetchika sveta.** [Measurement of the short wave end of the solar spectrum by means of the light counter.]

Item 2.3–43: Balakov, V., Vafiadi, V. and Krivich, S., **Izmerenie kontsentratsii atmosfernogo ozona metodom pogloshcheniia ul'trafioletovykh luchei.** [Measurement of concentrated atmospheric ozone by means of absorption of ultraviolet rays.]

Item 2.3-157: Baranov, S. and Pokrovskaia, I., **Rabota meteorologicheskoĭ gruppy EKNE 1935 g.** [Meteorological observations made on the Elbrus by the Combined Expedition of the Academy of Sciences in 1935.]

Item 2.2-81: Zhukov, A. and Frank, G., **Fiziologicheskie issledovaniia na El'bruse.** [Physiological investigations on the Elbrus.]

Item 2.2–149: Serafimov, B., **Gornaia bolezn'.** [Mountain sickness.]

Item 2.3-162: Vladimirov, G. and Raĭko, K., **Vliianie shtandartnoĭ myshechnoĭ raboty v vysokogornykh usloviiakh na molochnuiu kislotu krovi.** [The influence of standard muscular work at high altitudes on the lactic acid content of the blood.]

Item 2.3–163: Vladimirov, G., Miliushkevich, G. et al., **Vliianie akklimatizatsii na gazovyĭ sostav krovi.** [The influence of acclimatization on the gaseous content of the blood.]

Item 2.4–175: Baĭchenko, I., **Gazoobmen v pokoe i pri dozirovannoĭ myshechnoĭ rabote na vysote 3000 i 4250 m.** [The gaseous metabolism during rest and standard muscular work at altitudes of 3000 and 4250 m.]

Item 2.5–186: Zhukov, A., **Metodika i rezul'taty issledovaniia organa slukha na vysotakh.** [Methods and results of observations on the auditory organs at high altitudes.]

Item 2.7–174: Zhukov, A., **Dinamika izmeneniĭ vozbudimosti kozhnoĭ chuvstvitel'nosti i zritel'nogo apparata na vysotakh.** [Dynamics of the changes in the tactile and visual sensations at high altitudes.]

Item 2.4–176: Kronheim, Georg, **K klimatofiziologii obmena veshchestv.** [Climate and the physiology of metabolism.]

Item 2.4–177: Timofeev, N., **Izmeneniia ostroty vkusa i reaktsii sliunootdeleniia na vkusovye razdrazhiteli v zavismosti ot prebyvaniia na razlichnykh vysotakh gory El'brusa.** [Changes in the acuity of taste and the reactions of salivary glands to taste stimulants at various altitudes on Mount Elbrus.]

Item 2.6–135: Vereshchagin, N. and Boldyrev, V., **Izmenenie vegetativnykh protsessov v organizme pri prebyvanii v vysokogornykh usloviiakh.** [Changes in some vegetative functions in an alpine climate.]

Item 2.2–148: Fedorov, N. and Fedorova, V., **Ob izmeneniiakh tsvetnogo zreniia na El'bruse.** [On changes in color vision on the Elbrus.]

Item 2.1–113: Zhikharev, S. and Prilezhaeva, T., **O nekotorykh izmeneniiakh krovi v usloviiakh vysokogornogo klimata.** [Blood changes in an alpine climate.]

Item 2.3-160: Kronheim, G. and Prokof'eva, E., **Vliianie nekotorykh faktorov gornogo klimata na obmen veshchestv.** [The influence of certain factors of a mountain climate on metabolism.]

Item 2.2–80: Zhikharev, S., **Reaktsii kozhi na deĭstvie luchistoĭ energii v vysokogornom klimate.** [Reaction of the skin to radiant energy in an alpine climate.]

Item 2.1–106 is another paper referring to the expedition: Rodionov, S. F., **Prozrachnost' atmosfery v ul'trafioletovoĭ oblasti spektra.** [Transparency of the atmosphere in the ultra-violet part of the spectrum.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr. i. Geofiz.*, 14(4):334–358, July–Aug. 1950. 17 figs., 8 tables, 19 refs., 18 equations. **DLC**—*Subject Headings:* **Mountain meteorology, Bioclimatology, Physiological climatology, Elbrus Expedition, Caucasus, U.S.S.R.**

2K–180 551.506.5(54)

Bleeker, Wouter, **Meteorologisches zu den 3 holländischen Karakorum-Expeditionen. 1.** [Meteorology in the 3 Dutch Karakoram expeditions.] (*K.*) *Akademie van Wetenschappen te Amsterdam, Proceedings*, 39(6-8), **1936.** 27 p. 4 figs., 75 small tables. **DLC**—A combined summary of observations for June through September 1922, 1925, 1930, reduced to heights of 3500, 4000 . . . 6000 m. in Hunza, 36°N., 75°E. and Karakoram, 35°N., 77°E., separately for morning, midday, evening and mean. The sections deal with temperature (including vertical lapse 3250–5750 m. compared with upper air data at Agra, snow line and abnormal warmth over 6000 m.), vapor pressure, relative humidity, air pressure, cloud, wind, precipitation. The winds and cloud are used for a discussion of streamlines. Precipitation is discussed in relation to passage of a disturbance. *Subject Headings:* **Mountain meteorology, Expeditionary climatic data, Karakoram, India.**

2K–181 551.573:551.43

Conrad, Victor, **Die Evaporationskraft des Hochgebirges.** [The evaporating power in high mountains.] *Zeitschrift für angewandte Meteorologie*, 53:111–115, **1936.** 2 tables. **DWB**—From the hydrometric balance in four high Alpine valleys (1360–2850 m.) author finds evaporation (cm.) $=42-.0074\,h$. *Subject Headings:* **Mountain meteorology, Evaporation.**

2K–182 551.576:551.55

†Dreyling, H., **Das Auftreten von Bergnebel in Abhängigkeit von der Windrichtung. Eine Untersuchung über die Nebelverhältnisse auf mitteleuropäischen Gebirgsgipfeln.** [The occurrence of mountain fog in relation to the wind direction. An investigation of the fog conditions on central European mountain peaks.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 2(5), **1936.** 19 p. 9 figs., 13 tables, 11 refs. **DLC**—From 10-year observations at 9 central European mountain stations 684–1602 m. it is found that the orography traversed by the air mass is important. The seasonal percentage frequency of fog is tabulated in relation to wind direction. Influence of height is dominant, frequency increasing up to 2000–2500 m., it increases from summer to winter and from morning to midday. Variations with wind direction are analyzed for each station, and the data should help in fog forecasting for mountains. *Subject Headings:* **Mountain meteorology, Fog, Europe.**

2K–183 551.555(45)

§Eredia, Filippo, **Di una singolarità aerologica della costa Tirrenica della Calabria.** [On an aerological peculiarity of the Tyrrhenian coast of Calabria.] *Meteorologia Pratica*, 17(2):49–57, March–April **1936.** 5 figs., tables, **DWB**—Although only some 600 m. high, the coastal district round Paola has very strong orographic winds from NE and E blowing down a wide valley. The example of 13–14 Nov. 1935 is analyzed with charts and upper winds. *Subject Headings:* **Orographic effects, Winds, Calabria, Italy.**

2K–184 551.576.11:778.5

Kampé de Fériet, J., **Atmosphärische Strömungen; Wolkenstudien nach Kinoaufnahmen im Hochgebirge (Jungfrau und Matterhorn).** [Atmospheric currents; cloud studies from cinematic photos in high mountains (Jungfrau and Matterhorn).] *Meteorologische Zeitschrift*, 53:277–280, **1936.** 4 figs. **DWB**—Cinema films, time interval 1–2 seconds, were used to find tracks of air particles on upper surface of cumuliform clouds over Jungfrau and in lee of Matterhorn. The latter were also investigated with a model in a wind tunnel. *Subject Headings:* **Mountain meteorology, Clouds, Swiss Alps.**

2K–185 551.554:551.43

Schell, I. I., **On the vertical distribution of wind velocity over mountain summits.** *American Meteorological Society, Bulletin*, 17:295–300, **1936.** 3 tables. **MH-BH**—A general discussion of the various factors in the problem, illustrated by observations on Ai-Petri range in Crimea (Bedenkir 1320 m., Chaptyrma 1275 m., Rok 1346 m.) giving vertical distribution of velocities up to 200 m. above peaks. *Subject Headings:* **Mountain meteorology, Winds, Crimea, U.S.S.R.**

2K–186 551.524.3

Schmauss, August, **Die interdiurne Veränderlichkeit der Temperatur auf der Zugspitze.** [The interdiurnal variability of temperature on the Zugspitze.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 2(1), **1936.** 26 p. 17 figs., 9 tables. **DLC**—Mean value 2.26°C. Diagrams show annual variation of frequencies and means, singularities and secular variation. *Subject Headings:* **Mountain meteorology, Temperature variations, Zugspitze, Germany.**

2K–187 551.582:551.43(43)

Schröder, Kurt, **Der Harz als Kurgebiet.** [The Harz as a health resort.] Braunschweig, E. Appelhaus, **1936.** 121 p. **GB-MO.** Review in *Meteorologische Zeitschrift*, 53:441–442, **1936. DWB**—Includes: "Wetter und Klima," [Weather and climate], by L. Schulz. p. 66–88. Pt. 1 discusses the weather of the Harz, notably the frequency of air mass changes and their relation to mountain winds. Pt. 2 discusses temperature conditions in detail, especially frequencies, diurnal variation and cooling power. Pt. 3 considers sunshine and solar radiation; the winter sunshine is 3–4 times that in the plain. *Subject Headings:* **Mountain meteorology, Mountain resorts, Harz Mountains, Germany.**

2K–188 551.578.42(234.3)

Steinhauser, Ferdinand, **Über den Schneeanteil am Gesamtniederschlag im Hochgebirge der Ostalpen.** [On the proportion of snow in the total precipitation of the eastern Alps.] *Beiträge zur Geophysik*, 46:405–412, **1936.** 2 figs., 3 tables. **DWB**—At Sonnblick and Obir precipitation for each month is divided into four groups: rain, rain and graupel or hail, rain and snow, snow. Each part is expressed as a % of total for month. Monthly variations are shown graphically and in tables. *Subject Headings:* **Mountain meteorology, Precipitation, Alps.**

2K–189 551.571.36(234.3)

Steinhauser, Ferdinand, **Über die Häufigkeitsverteilung des Dampfdruckes im Hochgebirge und in der Niederung und ihre Beziehungen zueinander.** [On the frequency distribution of vapor pressure in high mountains and the lowland, and their relations to each other.] *Meteorologische Zeitschrift*, 53:415–419, **1936.** 2 figs., 3 tables. **DWB**—Comparison of 25 years observations of vapor pressure at Sonnblick (3106 m.) and Salzburg (430 m.). Frequency curves are given for 7, 14 and 21 h. and statistically discussed. Mean ratio Sonnblick/Salzburg, 7 h., 0.41; 14 h., 0.43; 21 h., 0.40, minimum Feb., maximum July. *Subject Headings:* **Mountain meteorology, Vapor pressure, Sonnblick, Austrian Alps.**

1937

2K–190 551.515.8(234.3)

Bouet, Max, **Les phénomènes préfrontaux dans les Alpes.** [Pre-frontal phenomena in the Alps.] *Société Vaudoise des Sciences Naturelles, Bulletin*, 60:83–94, **1937.** 2 figs., 18 refs. **DLC**—Temperature records at Alpine summit stations in Switzerland show evidence of cooling preceding the cold front by several hours. The cases considered are Aug. 27, 1932, March 17, 1933 and Aug. 14, 1933. The facts do not accord with a single frontal surface, but rather with horizontal sliding of masses of cold air above 1500 m., not clearly related to the front at the ground. *Subject Headings:* **Mountain meteorology, Fronts, Cold waves, Swiss Alps.**

2K–191 551.557.1(234.3)

Burger, A. and Ekhart, E., **Über die tägliche Zirkulation der Atmosphäre im Bereiche der Alpen.** [On the daily circulation of the atmosphere in the region of the Alps.] *Beiträge zur Geophysik*, 49:341–367, **1937.** 14 figs., tables, 10 refs. German and English summaries p. 341–342. **DWB**—Using pilot balloons morning and noon at 20 stations, plotted as resultants at ½ km. intervals up to 5 km., it is found that the mean diurnal variation of wind in summer is made up of a "general" wind system due to the diurnal variation of pressure, and a circulation caused by the unequal heating of mountains and plains. The latter blows inwards at the surface and outwards above a neutral layer which rises from 1300 m. over the plains to over 3000 m. in the central region. This results in a divergent effect on the general wind, which can be recognized up to a height of 5 km. at noon, as shown by streamlines. *Subject Headings:* **Mountain meteorology, Upper air winds, Alps.**

2K–192 551.521.11(234.3)

Garnett, Alice, **Insolation and relief.** *Institute of British Geographers, Publication* No. 5, **1937.** 71 p. 40 figs., maps. **DLC**—A detailed study of four Alpine valleys with different orientations, showing extent of shadows at different times of day at solstices and equinoxes, and duration of insolation. *Subject Headings:* **Mountain meteorology, Insolation, Alps.**

2K–193 551.575(234.3)

Hader, F., **Der Nebel in alpinen Landschaften.** [Fog in Alpine landscape.] *Meteorologische Zeitschrift*, 54:183–186, **1937.** fig., 4 tables, 6 refs. **DWB**—Two types of fog are distinguished, true valley radiation fogs and peak condensation fogs. Their characteristics, frequencies, annual variation and relation to wind and cloud are discussed. The ratio of the number of fogs with calms to those with wind changes from 1:0.03 in valley to 1:11 on Obir and 1:362 on Sonnblick. *Subject Headings:* **Mountain meteorology, Fog, Alps.**

2K–194 551.521.3 551.521.1

Lauscher, Friedrich, **Die Zunahme der Intensität der Sonnenstrahlung mit der Höhe. (Nach Messungen in Kremsmünster und auf dem Feuerkogel.)** [The increase of the intensity of solar radiation with height. (From measurements in Kremsmünster and on the Feuerkogel.)] *Beiträge zur Geophysik*, 50:202–215, **1937.** 8 tables. German, English and French summaries p. 202. **DWB**—From 1933–36 actinometric measurements at Kremsmünster (390 m.), Traunkirchen (440 m.) and Feuerkogel (1577 m.), all in Austria, mean values were computed of intensity for different elevations of the sun and of Linke's turbidity. Decrease of intensity 1577–390 m. is 10 times that due to pure air; with solar height 60° mountain radiation is 10% greater than on plain; with sun height 5°, 100% greater. *Subject Headings:* **Mountain meteorology, Solar radiation, Austrian Alps.**

2K–195 551.521.1:551.588.2(234.3)

Lauscher, Friedrich, **Zusammenhänge zwischen Monatswerten der Sonnenscheindauer und der Strahlungsintensität in zwei verschiedenen Höhen der Alpen.** [Relation between monthly values of sunshine duration and of radiation intensity at two different heights in the Alps.] *Meteorologische Zeitschrift*, 54:284–289, **1937.** 4 tables. **DWB**—Compares observations at Feuerkogel and

Kremsmünster 1933–36. In winter mountains are much sunnier than lowland (December, 43% of possible against 17) and there is no relation between amounts. In summer both vary together. Variations of intensity are much less than of duration; both stations vary together. Mean intensity of radiation, mountain: Dec., 1.41 cal./cm²/min., June 1.45; plain, Dec. 1.08, June 1.32. *Subject Headings:* **Mountain meteorology, Sunshine duration, Solar radiation, Austrian Alps.**

2K–196 551.577.51 551.577.2(44)

Mathias, E., **Le régime mensuel de la pluie, en fonction de l'altitude, dans le Puy-de-Dôme et les départements voisins du Plateau Central (Loire, Allier, Haute-Loire).** [The monthly regime of rainfall, as a function of height, in the Puy-de-Dôme and the neighbouring departments of the Plateau Central.] *La Météorologie*, **1937.** p. 357–379. figs., numerous tables. **DWB**—The main table gives monthly means of rainfall at 146 stations from 300–1535 m. These are analysed into three "oscillations" according to number of maxima and minima in annual curve, and their variations with height studied. *Subject Headings:* **Mountain meteorology, Precipitation, Puy-de-Dôme, France.**

2K–197 551.574.42:551.574.7

Pagliuca, S., **Icing measurements on Mount Washington.** *Journal of the Aeronautical Sciences*, 4:399–402, **1937.** 6 figs., tables, 2 refs. **DLC**—Paper discusses experimental methods used on Mount Washington for measurement of rime deposition and possible application of these methods for study of icing on aircraft. Table includes results of rime deposition test on Mount Washington. (*Same abstract* as No. I–28 in Sept. 1950 *Meteorological Abstracts.*) *Subject Headings:* **Rime, Icing meters, Mount Washington, New Hampshire.**—*H.P.K.*

2K–198 551.524.31:551.43

Steinhauser, Ferdinand, **Über die täglichen Temperaturschwankungen im Gebirge.** [On daily temperature oscillations in the mountains.] *Beiträge zur Geophysik*, 50:360–367, **1937.** fig., 3 tables. **DWB**—Frequency distributions of non-periodic daily temperature oscillations are shown for 6 stations in Sonnblick region for 4 seasons and discussed, notably the skew type on Sonnblick (small changes predominate owing to small daily range). *Subject Headings:* **Mountain meteorology, Temperature variations, Sonnblick, Austrian Alps.**

1938

2K–199 551.578.42(82)

Ceppi, H., **Los estudios de nieve en la Cordillera y la Patagonia.** [Snow studies in the Cordillera and in Patagonia.] *Gaea*, Buenos Aires, 6:283–294, **1938.** chart, photos. **DLC**—Includes a chart of the frequency of snow in the Argentine. Snowfall in the Cordilleras is economically very important, and is being studied by totalisators in regions difficult of access. *Subject Headings:* **Mountain meteorology, Snow, Andes, Argentina.**

2K–200 551.501.9:551.43(438)

Contessa, P., **Un nuovo osservatorio polaccio di montagna.** [A new Polish mountain observatory.] *Rivista di Meteorologia Aeronautica*, 2(4):67–70, **1938.** 3 refs. **MH-BH**—Describes an observatory established by Dr. Stenz in the High Tatra. *Subject Headings:* **Mountain meteorology, Mountain observatories, Poland.**

2K–201 551.521.11(234.3)

Conrad, Victor, **Anomalien und Isanomalien der Sonnenscheindauer in den österreichischen Alpen.** [Anomalies and isanomalies of the sunshine duration in the Austrian Alps.] *Vienna, Zentralanstalt für Meteorologie und Geodynamik, Jahrbuch* 1932, *Beihefte*, 5, **1938.** 20 p. 4 plates. **MH-BH**—Monthly means for about 90 sunshine recorders at heights 100–3100 m. were grouped by height stages of 100 m. These showed the transition of the annual variation from the "inversion and thunderstorm" type with summer maximum in the Alpine foreland and valleys to the summit type with winter maximum. *Subject Headings:* **Mountain meteorology, Sunshine duration, Austrian Alps.**

2K–202 551.521.11(234.3)

Conrad, Victor, **The yearly variation of the duration of bright sunshine with height above sea level.** *American Meteorological Society, Bulletin*, 19:392–393, **1938.** **MH-BH**—Refers to preceding item. The monthly values 100–3100 m. in Austrian Alps were analyzed into annual and semi-annual components. The phase of the annual wave is reversed between lowest and highest stations, changing by 100° between 2000 and 2400 m. Amplitude is given by $22.5 - 1.925\ h + 0.045\ h^2$ (h in 100

meter units). There is a real semi-annual wave of amplitude 5.6% which is dominant between 2000 and 2400 m., the cause of which is not known. *Subject Headings:* **Mountain meteorology, Sunshine duration, Austrian Alps.**

2K–203 551.582(969)

Coulter, John Wesley; Raine, Clarence T. and Wentworth, C. K., **Meteorological reports of the Mauna Kea expedition 1935 I–III.** *American Meteorological Society, Bulletin*, 19(8):349–351, Oct. 1938; 20(3,9):97–105, 417–418, March, Nov. 1939. 2 figs., 11 tables. **MH-BH**—Observations were taken at Lake Waiau (13,010 ft.) near the summit and at Humuula (6685 ft.). Pt. I deals with mean temperature on Mauna Kea and in free air over Pearl Harbor; mean summit and free air temperatures differ little. Pt. II gives a narrative of the expedition, notes on the instruments and tabular summaries of the observations (including hourly temperatures and winds), and impressions of the weather. Pt. III briefly discusses climate of the Humuula plateau. *Subject Headings:* **Mountain meteorology, Mauna Kea, Hawaiian Islands.**

2K–204 551.585.7(64)

Debrach, J. and Bidault, G., **État de nos connaissances sur le climat de la montagne marocaine.** [State of our knowledge of the climate of the Moroccan mountains.] *Hesperis*, Paris, 2–3 trimestre, p. 199–209, 1938. **DLC**—Climate of both slopes of the Atlas Mountains in Morocco is discussed on the basis of stations up to 2000 meters, under headings: solar radiation and cloudiness, mean temperature and annual variation, precipitation. The heights of the various stages—arid, semi-arid, temperate, humid, high mountain, on the north and south slopes of the range are shown diagrammatically and the influence of the mountains on air masses and the climate of Morocco is discussed. *Subject Headings:* **Mountain meteorology, Atlas Mountains, Morocco.**

2K–205 551.577.3:551.578.43(494)(234.3)

Eckel, O., **Ueber die Schneeverhältnisse von Davos. (Mit einem Beitrag über die Niederschlagsverhältnisse im allgemeinen.)** [On the snow conditions of Davos. (With a contribution on the precipitation conditions in general.)] *Naturforschende Gesellschaft, Graubünden, Jahresbericht*, 75:109–156, 1938. **DLC**—Systematic observations over nearly 50 years are summarized—number of days precipitation, percent rain and snow, droughts and rainy periods, depth of snow and water equivalent, duration of snowfall, probability of minimum thickness of snow cover etc. *Subject Headings:* **Mountain meteorology, Snow, Davos, Switzerland.**

2K–206 551.553.12(234.3)

†Ekhart, E., **Die Tageszeitenwinde der Alpen. Eine Darstellung nach dem neuesten Stande unseres Wissens.** [The daytime winds of the Alps. An exposition based on the latest position of our knowledge.] *Naturwissenschaften*, 26:21–27, 1938. fig. **DWB**—The theory of mountain wind circulation is set out (valley wind—slope wind—compensation current—downflow over plain). Numerous references 1931–1937. *Subject Headings:* **Mountain meteorology, Mountain winds, Alps.**

2K–207 551.585.7(234.3)

Fabris, C., **Le Alpi come fattore meteorologico.** [The Alps as a meteorological factor.] *Ateneo Veneto, Venice*, 129(123):99–108, 1938. **DLC**—The Alps hold up air streams up to the height of the main cols (1500 m.). They favor discontinuities, secondary depressions and thundery disturbances, delay fronts and create conditions for föhn. *Subject Headings:* **Mountain meteorology, Streamlines, Alps.**

2K–208 551.582:551.515.8(52)

Iida, T. and Kinka, T., **On the wind-rose of meteorological elements on Mt. Tukuba.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 16(10):411–415, Oct. 1938. 5 figs., 8 tables. In Japanese, English summary p. (36). **DLC**—Tables show for each month for 16 wind directions, deviations from mean of temperature, vapor pressure, dew point and equivalent potential temperature. The latter is regarded as the most conservative, and the figures show the character of the polar maritime air brought from the Okhotsk Sea by the NE wind. *Subject Headings:* **Mountain meteorology, Air masses, Japan.**

2K–209 551.501.9

Lugeon, Jean, **La météorologie de haute montagne et le nouvel Observatoire de Jungfraujoch.** [The meteorology of high mountains and the new observatory of Jungfraujoch.] *Schweizerische Hochschul-Zeitung*, 11(5), 1938. **NN**—Author describes the mountain observatories in Poland and the program. He makes some suggestions for the Sphinx Observatory on Jungfraujoch completed in 1937. Unchecked. *Subject Headings:* **Mountain meteorology, Mountain observatories, Poland, Jungfraujoch, Switzerland.**

2K–210 551.506.3(234.3) 551.582(234.3)

*Steinhauser, Ferdinand, **Die Meteorologie des Sonnblicks. I Teil. Beiträge zu Hochgebirgsmeteorologie nach Ergebnissen 50-jähriger Beobachtungen des Sonnblick-Observatoriums, 3106 m.** [The meteorology of the Sonnblick. Pt. I. Contributions to high mountain meteorology from results of 50-year observations of the Sonnblick Observatory 3106 m.] Wien, J. Springer, **1938.** 180 p. plate, figs., tables, bibliography p. 176–178. **DWB**—Detailed review in *Meteorologische Zeitschrift*, 55:448–454, 1938. Mainly tables of daily averages and frequencies of the various elements for 1887 through 1936, based on observations at 7, 14, 21 h. and autographic records. Monthly means and aggregates are given in Appendix. *Subject Headings:* **Mountain meteorology, Long period records, Sonnblick, Austria.**

2K–211 551.576.11:551.558.2

Sugawara, Y., **The cloud cap of Fuji.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 16(6):248–249, **1938.** 2 figs. German summary p. (20). **DWB**—When the obstacle wave extends above condensation level, it forms a very characteristic cloud cap. The shape and structure of this cloud are analyzed by tracing particle trajectories over a long semicylindrical obstacle. *Subject Headings:* **Mountain meteorology, Clouds, Mt. Fuji, Japan.**

2K–212 551.508.53/4:551.43

Sugawara, Y., **Wind measurements at mountain stations.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 16(6):241–247, June **1938.** In Japanese, summary in English p. (20). 6 figs. **DWB**—Icing up of anemometer by rime from fog was overcome by heating the anemometer tube. A gustiness recorder is described consisting of two statoscopes. These instruments gave satisfactory records on Mt. Fuji. *Subject Headings:* **Mountain meteorology, Anemometers.**

1939

2K–213 551.576.1

Abe, M., **The classification of cloud forms of Mt. Fuji.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 17(5):163–181, May **1939.** 5 figs. In Japanese, English summary p. (17). **DWB**—Clouds are classified into 20 types according to movement and obstacle (ascending, descending, rotary, counter current etc.). These are shown in sketches, but as the legends are in Japanese the relations of the sketches to the classification is obscure. *Subject Headings:* **Mountain meteorology, Clouds, Japan.**

2K–214 551.574.42

Bricard, J., **Étude sur la formation du givre au sommet du Puy de Dôme.** [Study of the formation of rime on the summit of the Puy de Dôme.] *Académie des Sciences, Paris, Comptes Rendus*, 208:1236–1238, **1939.** 2 tables. **DWB**—Formation of rime on a plate normal to the wind was studied microscopically, giving mean diameter of droplets, time of solidification, temperature and wind. In light wind at low temperature small drops freeze separately and the rime is brittle; in strong winds large drops freeze together giving hard, transparent ice. *Subject Headings:* **Mountain meteorology, Rime, Puy de Dôme, France.**

2K–215 551.593:551.43

†*Brocks, K., **Vertikaler Temperaturgradient und terrestrische Refraktion, insbesondere im Hochgebirge.** [Vertical temperature gradient and terrestrial refraction, especially in high mountains.] *Berlin, Universität, Meteorologisches Institut, Veröffentlichungen*, 3(4), **1939.** 80 p. 30 figs., 39 tables, 10 equations, 106 refs. **MH-BH**—Begins with a theoretical discussion of atmospheric refraction of light, its local coefficient depending on pressure and temperature and its variations with time. Then follows a summary of measurements of refraction on Sonnblick, by exact observations of definite objects at distances of 2.7 to 41.7 km. at heights of 1100–3681 m. This and other material is tabulated and used for a discussion of diurnal fluctuation and variability of refraction compared with vertical temperature gradient. Diurnal variation is a very regular whole day sine wave, the amplitude depending on length of path and mean height. The annual variation is next discussed. Various methods of calculating refraction for geodetic purposes from the available meteorological data, and the errors of trigonometric height measurement, are discussed. Finally the author shows with examples how zenith distance measurements can give accurate values of mean vertical temperature gradient. *Subject Headings:* **Mountain meteorology, Atmospheric refraction, Vertical temperature gradient.**

2K–216 551.506.2(234.3):551.521

Chorus, Ulrich, **Sonnen- und Himmelsstrahlung auf dem Jungfraujoch während des internationalen Polarjahres 1932/33.** [Sun and sky radiation on the Jungfraujoch during the inter-

national Polar Year 1932/33.] *Helvetica Physica Acta*, 12:537–552, **1939.** 11 figs., 2 tables, 7 refs. **DLC**—Summarizes observations at 3472 m. with Gorczynski solarimeter, Robitzsch actinograph and sunshine recorder. Data include hour-month isopleths of total sun+sky radiation on a horizontal surface, dependence on cloudiness, sky radiation and duration of sunshine. *Subject Headings:* **Mountain meteorology, Radiation, Sunshine duration, Jungfraujoch, Switzerland.**

2K–217 551.553.6:551.588.2

Conrad, Victor, **The frequency of various wind velocities on a high and isolated summit.** *American Meteorological Society, Bulletin*, 20:373–376, **1939.** 7 figs. **MH-BH**—Curves of frequencies of various speeds on Sonnblick (Jan., July, difference) and at Salzburg, and of E. and W winds. In single Januaries three types of curve are distinguished. *Subject Headings:* **Mountain meteorology, Winds, Sonnblick, Austria.**

2K–218 551.524.4:551.524.7(234.3)

Ekhart, E., **Mittlere Temperaturverhältnisse der Alpen und der freien Atmosphäre über dem Alpenvorland. Ein Beitrag zur dreidimensionalen Klimatologie. I Teil. Die Temperaturverhältnisse der Alpen.** [Mean temperature conditions of the Alps and the free atmosphere over the Alpine foreland. A contribution to three-dimensional climatology. Pt. I. The temperature conditions of the Alps.] *Meteorologische Zeitschrift*, 56:12–26, **1939.** 8 figs., 14 tables, 13 refs. **II Teil. Die Temperaturverhältnisse der freien Atmosphäre über München und Vergleich mit den Alpen.** [Pt. II. The temperature conditions of the free atmosphere over Munich and comparison with the Alps.] *Ibid.*, p. 49–57. 4 figs., 8 tables, 10 refs. **DWB**—The mean temperature distribution 1907–36 at peak stations 250–3250 m. is studied in relation to height. Free, well ventilated peaks offer the only means for a comparison of temperatures at different heights. These temperatures are compared with free air temperatures over Munich. Difference Alps—free air increases from nearly 0 at 500 m. to 1–2°C. at 3100 m. *Subject Headings:* **Mountain meteorology, Temperature, Alps.**

2K–219 551.594.1

Gerasimova, M. N., **Atmosferno-elektricheskie izmereniia na Elbruse.** [Atmospheric electricity measurements on Mt. Elbrus.] *Akademiia Nauk, SSSR, Izvestiia, Seriia Geogr. i Geofiz.*, No. 4–5:397–416, **1939.** 9 figs., 8 tables, 11 refs. English summary p. 415–416. **DLC**—Observations at 4250 m. of discharge from a pointed rod, volume charge of atmosphere, small ion content, conductivity and potential gradient are represented mainly by curves, and relations between them are calculated. The maximum gradient in thunderstorms was 6000 v./m. During fog increased positive potential gradient and negative volume charge were observed. *Subject Headings:* **Mountain meteorology, Atmospheric electricity, Mount Elbrus, Caucasus, U.S.S.R.**

2K–220 551.585.7 551.582(47)

Gurgenidze, G., **Klimaticheskaia kharakteristika raĭona vysokogornoĭ meteorologicheskoĭ stantsii na Kasbeke.** [Climatological characteristics in the locality of the high level meteorological station on Mount Kasbek.] *Meteorologiia i Gidrologiia*, No. 3:45–53, **1939.** 11 tables. **MH-BH**—Sets out monthly means and frequencies of temperature, wind direction, precipitation of different types and sunshine. The station is at a height of 4019 m. in central Caucasus. *Subject Headings:* **Mountain meteorology, Caucasus, U.S.S.R.**

2K–221 551.578.46(234.3)

*Kossinna, Erwin, **Die Schneedecke der Ostalpen.** [The snow cover of the eastern Alps.] *Deutsches Museum der Länderkunde, Wissenschaftliche Veröffentlichungen, Neue Folge*, 7:69–93, **1939.** 5 figs. fold. col. map, 6 tables, 32 refs. **GB-MO**—A discussion of all available data by river valleys. Tables give for each station height (up to 2962 m.), duration of snow cover, precipitation and greatest depth of snow, for Bavaria, Württemberg, Austria, Italian and Hungarian Alps. Small charts show duration of snow cover at 500, 1000, 1500, 2000 and 2500 m. Folding chart shows duration in great detail, 45–48½°N., 9½–16½°E. Conditions in the separate regions are discussed. *Subject Headings:* **Mountain meteorology, Snow cover, Alps.**

2K–222 551.582(515)

Lu, Alfred, **A brief survey of the climate of Lhasa.** *Royal Meteorological Society, Quarterly Journal*, 65(281):297–302, **July 1939.** 10 tables. **MH-BH**—The Chinese station is at a height of about 3732 m. on a plateau surrounded by mountains mostly above 5000 m. The climate is calm and very severe. Monthly tables over 4 years are given of pressure, wind direction and mean force, mean daily and absolute maximum and minimum temperature, frosts, precipitation (remarkably

variable summer rainfall; July totals ranged from 2050 mm. in 1936 to 83 mm. in 1937), rain days, relative humidity, cloud and haze. (*Same item* as No. 2F–134 in June 1951 *Meteorological Abstracts*.) *Subject Headings:* **Mountain meteorology, Climatic data, Lhasa, Tibet.**

2K–223 551.515.8:551.588.2(47)

§Malik, S. A., **Maskirovka frontov Kavkazom.** [The masking of fronts by the Caucasus.] *Meteorologiia i Gidrologiia*, No. 6:34–45, **1939.** 16 figs., 8 tables, 5 refs. **DLC**—Includes a number of charts, diagrams and upper air ascents showing blocking of polar and arctic air against slopes of Caucasus, and the process of surmounting the crest. *Subject Headings:* **Mountain meteorology, Cold waves, Fronts, Caucasus, U.S.S.R.**

2K–224 551.576.11:551.43

§Reinhardt, H., **Ein Beitrag zum Problem der hohen Hinderniswolken.** [A contribution to the problem of high obstacle clouds.] *Beiträge zur Physik der freien Atmosphäre*, 26(1):23–37, **1939.** 16 figs., 21 refs. **DLC**—Information about the high obstacle clouds and low turbulence clouds on the lee of the Riesen Gebirge in föhn weather is set out, with M.S.L. isobars and 500 mb. isohypses, upper air ascents and anemograms. Two types of lee waves are distinguished, an upper system and also travelling whirls with horizontal axes in the turbulent zone. *Subject Headings:* **Mountain meteorology, Cloud structure, Turbulence, Riesen Gebirge, Germany.**

2K–225 551.521.3(234.3)

Steinhauser, Ferdinand, **Die Zunahme der Intensität der direkten Sonnenstrahlung mit der Höhe im Alpengebiet und die Verteilung der "Trübung" in den unteren Luftschichten.** [The increase of the intensity of direct solar radiation with height in the Alpine region and the distribution of turbidity in the lower air layers.] *Meteorologische Zeitschrift*, 56:172–181, **1939.** 2 figs., numerous tables and refs. **DWB**—Mean daily variation of direct solar radiation in the eastern Alps is calculated for various heights up to 3000 m. for various sun heights, and changes in the annual and diurnal variation with height are discussed, also annual variation of turbidity. Radiation on a surface normal to the sun is calculated for cloudless days, and the ratio diffuse/direct radiation. *Subject Headings:* **Mountain meteorology, Solar radiation, Turbidity, Alps.**

2K–226 551.515.4(234.3)

Weixlederer, Rudolf, **Studien über die alpine Gewittertätigkeit.** [Studies on Alpine thunderstorm activity.] *Meteorologische Zeitschrift*, 56:215–226, **1939.** 11 figs., 3 tables, 17 refs. **DWB**—Frequency of thunder May–Sept. is charted. Distribution of frequency of directions of travel is tabulated, also annual variation of frequency. A number of studies are made of isobronts of individual storms. *Subject Headings:* **Mountain meteorology, Thunderstorms, Alps.**

1940

2K–227 551.501.9:551.577.51

Dubois, B., **Mesures des précipitations effectuées au Mont-Ventoux de 1934 à 1937.** [Measurements of precipitation made on Mt. Ventoux from 1934 to 1937.] *La Météorologie*, **1940.** p. 157–161. 3 figs., table. **DWB**—The observatory is on the summit (1912 m.) in a region of strong winds greatly influenced by relief. A raingage with a horizontal aperture is inaccurate; measurements were made with various types of "vectopluviometers" on a round hillock near the summit. The "Mougin" gage gave a mean excess of 19% over the "Association" on the peak. *Subject Headings:* **Mountain meteorology, Precipitation, Rain gages, Mount Ventoux, France.**

2K–228 551.582(86)

Garavito Armero, J., **El clima de Bogotá.** [The climate of Bogota.] *Academia Columbiana de ciencias exactas, físicas y naturales, Revista*, 3:361–372, **1940. DLC**—Bogotá is on a plateau on the east slope of the Andes, height 2640 m. Meteorological observations were taken 1893 through 1897 at 8, 10, 12, 14, 16, 18 and 20 h. Data include diurnal and annual variation of temperature and humidity, annual variation of pressure, cloudiness, rainfall and wind. *Subject Headings:* **Mountain meteorology, Climatic data, Bogotá, Colombia, Andes.**

2K–229 551.501.9:551.43

Konček, N., **Das neue Höhenobservatorium in der Tatra (Lomnitzer Spitze, 2634 m.).** [The new high-level observatory in the Tatra.] *Meteorologische Zeitschrift*, 57:416–417, **1940.** 3 figs. **DWB**—Several stations were erected at halts on the cable railway. *Subject Headings:* **Mountain meteorology, Mountain observatories, Tatra Mountains, Czechoslovakia.**

2K–230 551.508.92 551.593.5

Löhle, F., **Über die Messung des mittleren Zerstreuungskoeffizienten und seiner spektralen Abhängigkeit auf dem Hohen Sonnblick.** [On the measurement of the mean coefficient of scattering and its spectral relations on the High Sonnblick.] *Beiträge zur Physik der freien Atmosphäre*, 27:38–48, **1940.** 3 figs. **DWB**—Discusses observations of visibility with a photometer, according to weather type, and daily variation. *Subject Headings:* **Mountain meteorology, Visibility, Sonnblick, Austria.**

1941

2K–231 551.506.1(238)

*Bogotá. Observatorio Nacional, **Anales, 1922–1936.** Continued as: Servicio Meteorológico Nacional De San Bartolomé. **Anales, 1941–43. MH-BH**—Includes detailed observations at Bogotá and summaries for other stations in the Columbian Andes, as well as occasional memoirs. *Subject Headings:* **Mountain meteorology, Climatic data, Bogotá, Colombia, Andes.**

2K–232 551.588.2:551.515.83(237)

Church, Phil E. and Stephens, T. Edward, **Influence of the Cascade and Rocky Mountains on the temperature during the westward spread of polar air.** *American Meteorological Society, Bulletin*, 22:25–30, **1941.** 4 figs., 3 tables. **MH-BH**—Analyses of fronts in Pacific Northwest Jan. 15–21, 1940, with cross sections showing isotherms of potential temperature. It is shown that with Pc air spreading westwards, the mountains prevent the coldest air from reaching the Columbia Basin; owing to adiabatic warming it reaches the coast with a temperature of about 0°C. *Subject Headings:* **Mountain meteorology, Cold waves, Cascade Mountains, Rocky Mountains, United States.**

2K–233 551.524.36

Conrad, Victor, **Structure of the weather on Mount Washington.** *Mount Washington Observatory, News Bulletin*, 9:2–4, July **1941. MH-BH**—Graphs show frequencies of occurrence of maximum and minimum temperatures at different hours. Peaks in maximum, midnight (advective) and noon-afternoon (radiation); in minimum midnight and sunrise. Ratio of advective minima/maxima is a useful climatic feature. *Subject Headings:* **Mountain meteorology, Temperature, Mount Washington, New Hampshire.**

2K–234 551.582(515)

Hsu, Ginn-Tze, **A note on the climatic conditions of Lhasa.** *American Meteorological Society, Bulletin*, 22:68–70, **1941. MH-BH**—A descriptive account of the cold dry season Oct. to April and the growing season May to Sept., including winds, frost and great variability of rainfall (1935, 650 mm., 1936 over 5000 mm.). Climatic type is designated "high CW." *Subject Headings:* **Mountain meteorology, Lhasa, Tibet.**

1942

2K–235 551.577.51

Dammann, W., **Gibt es im Gebirge eine Höhenzone maximalen Niederschlags?** [Is there a height zone of maximum precipitation in the mountains?] *Meteorologische Zeitschrift*, 59:19–21, **1942. DWB**—Author concludes that, owing to the great variety of weather conditions in the Harz, a zone of maximum precipitation below the summit can only occur in certain situations in the winter half-year. *Subject Headings:* **Mountain meteorology, Precipitation, Harz Mountains, Germany.**

2K–236 551.576.11:551.558.21

Eliassen, Arnt, **On the motion of air over a mountain ridge.** *Meteorologiske Annaler*, 1(5):103–113, **1942.** 5 figs., 16 equations. **DLC**—Author criticizes the observations of Moazagotl cloud and air flow over Riesen Gebirge given by J. KÜTTNER. He then sets out the equations of permanent two-dimensional flow with horizontal asymptotes in a stable atmosphere, but concludes that the necessary assumption of nearly rectilinear motion is rarely fulfilled. The formation and height of the cloud are discussed. *Subject Headings:* **Mountain meteorology, Moazagotl clouds, Riesen Gebirge, Germany.**

2K–237 551.555:551.43(74)

Eustis, Richard S., **The winds over New England in relation to topography.** *American Meteorological Society, Bulletin*, 23:383–387, **1942.** 7 figs. **MH-BH**—Average and maximum (1-minute) wind velocities at Mt. Whiteface, Washington, Wachusett and Blue Hill are compared with pilot balloon and kite observations. Ratios, mountain top/free air, are: summer, 1 km., 1.2, 2 km. 1.35; winter 1.5 and 1.75. Extreme velocities of 70–90 m./sec. at $1\frac{1}{2}$–$2\frac{1}{2}$ km. are up to twice greatest observed balloon speeds. *Subject Headings:* **Mountain meteorology, Winds, New England.**

2K–238 551.547.3(234.3) 551.524.7(234.3)

John, J. F., **Der Einfluss der Alpen auf die interdiurne Druck- und Temperaturveränderlichkeit der freien Atmosphäre.** [The influence of the Alps on the interdiurnal pressure and temperature changes in the free atmosphere.] *Meteorologische Zeitschrift*, 59:286–292, **1942.** 6 figs., 6 tables, 5 refs. **DWB**—The passage of air masses over the Alps leads to changes in the height of the tropopause, raising it on the windward side and depressing it to leeward. As the prevailing wind is west, the height over Pavia is lower and more variable than at Munich, and the interdiurnal pressure and temperature changes are different. *Subject Headings:* **Mountain meteorology, Tropopause, Interdiurnal variations, Alps.**

1943

2K–239 551.54(09)

Humbert, P., **Les deux récits de l'expérience du Puy-de-Dôme.** [The two accounts of the experiment on the Puy de Dôme.) *La Météorologie*, **1943.** p. 222–224. **DWB**—The barometric experiment by Florin Perier on Sept. 19, 1648 is described in Pascal's "Complete Works," 1936 (p. 170–174). Another account, which differs somewhat, is given by Pierre Gassendi, "Opera omnia," edition Anisson, 1658. *Subject Headings:* **Mountain meteorology, History of meteorology, Barometers, Puy de Dôme, France.**

2K–240 551.501.9:551.43(82)

Schereschewsky, P., **Una nueva estación meteorológica de altura en la República Argentina.** [A new high-level meteorological station in the Argentine Republic.] *American Meteorological Society, Bulletin*, 24:5–6, **1943.** English version p. 6. **MH-BH**—A short note on Cristo Redentor, 3900 m., Tres Cruces (Province Jujuy, 4500 m.) and Corridor de Cori (Gobernación de los Andes) at 5100 m. (25°10′S., 68°25′W.) *Subject Headings:* **Mountain meteorology, Mountain observatories, Andes, Argentina.**

1944

2K–241 551.55:551.577.37:551.508.77(794)

Hamilton, E. L., **Rainfall-measurement as influenced by storm-characteristics in Southern California Mountains.** *American Geophysical Union, Transactions*, **1944.** p. 502–518. 14 figs., 3 tables, 19 refs. **MH-BH**—Sixty storms in the San Gabriel Mountains were studied by using a directional rotating raingage, intensity gage and records of wind direction and speed. Northerly storms produce little precipitation at low intensity. Southerly storms give much intense rain inclined at a greater angle to the vertical. Storms are classified into patterns, and the data can be used to interpret past rainfall records. *Subject Headings:* **Mountain meteorology, Wind influences, Precipitation, California.**

2K–242 551.576.4:551.501.7

†Schüepp, Max, **Die Methoden zur Bestimmung der Wolkenhöhe in Gebirgsländern.** [The methods for determination of cloud height in mountainous countries.] Zurich, **1944.** 77 p. 49 figs., 7 tables, 104 refs., numerous equations. **DLC**—A most thorough study of the various methods of cloud height measurement, from a theoretical and a practical point of view. In 1651 Ricciolo measured the height of clouds by triangulation from two points of observation. Kämtz and others used the same method in the 19th century. Photographic methods were first used systematically in 1896/7 by Sprung and Süring. Lambert in 1773 used the time between lightning and thunder to determine the distance and thus by trigonometry the cloud height. He also used the speed of the cloud to provide data for calculating height. Modern methods used in Switzerland are described in detail. These include: ceiling projector, nephoscope, pilot balloon, airplane ascent, radiosonde, reflection from lakes, sighting over mountain peaks, calculation of condensation level, cloud paths, etc. Special consideration is given to elimination of errors in each method. *Subject Headings:* **Mountain meteorology, Cloud height measurement, Progress in meteorology.**—*M.R.*

1945

2K–243 551.577.51

Bonacina L. C. W. and others, **Orographic rainfall and its place in the hydrology of the globe.** *Royal Meteorological Society, Quarterly Journal*, 71(307–308):41–55, Jan.–April **1945.** fig. Discussion, *ibid.*, Feb. 21, 1945. **MH-BH**—Bonacina pointed out that very wet regions always have high relief. Maximum effects require elevations exceeding 10,000 ft. The conception of pure orographic rain is fallacious and he redefines it as "rain caused or intensified in various ways by the presence of high ground." He concludes that in spite of rain-shadows, mountains increase the general rainfall of the globe. R. M. Poulter discussed the role of instability. E. L. Hawke, D. Brunt, S. E. Ashmore, W. N. McClean, Gordon Manley and J. Glasspoole also spoke. *Subject Headings:* **Mountain meteorology, Orographic rainfall.**

2K–244 551.501.9:551.506.5(99)

Dorsey, H. G., Jr., **An Antarctic mountain weather station.** *American Philosophical Society, Proceedings*, 89:344–362, **1945. DLC.** Summary in *American Meteorological Society, Bulletin*, 27(8):471. Oct. 1946. **MH-BH**—Report with tables of first mountain observatory in Antarctic, more than 5000 ft. above M.S.L. on plateau of Palmer Peninsula, 1939–41. Included autographic records and pilot balloon data. *Subject Headings:* **Mountain meteorology, Mountain observatories, Climatic data, Antarctic.**

2K–245 551.585.7:551.524.7

Eide, Odd, **On the temperature difference between mountain peak and free atmosphere at the same level. II Gaustatoppen-Kjeller.** *Meteorologiske Annaler*, 2(3):183–206, **1945.** 5 figs., 9 tables, 19 equations. **DLC**—The mountain peak station of Gaustatoppen is at a height of 1792 dyn.m. Observations are compared with airplane ascents at Kjeller 140 km. to east. Peak averaged 2–3°C. colder than free air; maximum difference Sept.–Jan., minimum April–May. It increases with wind velocity, decreases with increasing lapse rate and in sunny weather. *Subject Headings:* **Mountain meteorology, Temperature, Norway.**

2K–246 551.577.51 551.508.77 551.501.9

Spinnangr, Finn and Eide, Odd, **On the measurement of precipitation: I. Fanaråken Meteorological Observatory.** *Meteorologiske Annaler*, 2(5):213–236, **1945. DWB**—Discusses problems and experiments in measuring precipitation at a mountain station, including location of gages. A factor by which observed precipitation should be multiplied to get true precipitation was favorably compared with theoretical computation of precipitation at the height of the observatory based on orography. Shielded gages and constant height of gage above snow surface are recommended. *American Meteorological Society, Bulletin*, 27(2):80, Feb. 1946. *Subject Headings:* **Mountain meteorology, Precipitation measurement.**

1946

2K–247 551.594.221:621.317.2

Berger, K., **Recherches suisses sur la foudre. Mesures effectuées au Monte San Salvatore, près de Lugano.** [Swiss researches on lightning. Measurements made on Monte San Savatore, near Lugano.] *Association Suisse Électrique*, 37(12), **1946.** 7 p. 15 figs. French and German summaries p. 1. **GB-MO**—Describes the complete installation on the summit of Mt. San Salvatore (915 m.) for oscillographic measurement of lightning currents (examples of records in 1943–45 shown). The results show great diversity of form, magnitude and duration, including short shocks of 10–50 kA for less than 3 microsec., weak currents of less than 1000 A for some tenths of a second, and of about 1000 A for barely 0.01 sec. *Subject Headings:* **Mountain meteorology, Lightning, Monte San Salvador, Switzerland.**

2K–248 551.585.7:551.521.1

Brockmann, W., **Von Strahlungsklima der Südschweiz. Klimaunterschiede zwischen Süd- und Nordseite der Schweizer Alpen.** [On the radiation climate of southern Switzerland. Climatic difference between the south and north sides of the Swiss Alps.] *Schweizerische Meteorologische Zentralanstalt, Annalen*, 82, *Anhang* 6, **1946.** 16 p. 7 figs., 11 tables, 2 photos, 2 diagrams. **DWB**—A comparative study of the mean frequency and intensity of radiation on the north and south slopes of Locarno Monti; other elements are also considered. *Subject Headings:* **Mountain meteorology, Radiation, Swiss Alps.**

2K–249 551.501.9:551.43(84)

Escobar V., Ismael, **"El Chacaltaya." I. Observatorio meteorológico. II. Glaciar suspendido.** [El Chacaltaya. I. Meteorological observatory. II. Hanging glacier.] *Revista Meteorológica*, 5:253–263, **1946.** 11 figs. **DLC**—The permanent Bolivian mountain meteorological observatory is at a height of 5500 m. in the Cordillera Real on a "hanging glacier." Observations include synoptic weather data, solar radiation and glacier studies. *Subject Headings:* **Mountain meteorology, Mountain observatories, Glaciers, Andes, Bolivia.**

2K–250 551.58:016(85)

†Indacochea G., Ángel J., **Bibliografía climatológica del Perú.** [Climatological bibliography of Peru.] *Perú, Instituto Geológico, Boletín*, No. 4, **1946.** 81 p. **DWB**—Nearly 1000 references are arranged alphabetically under authors. Many of these refer to mountain stations or conditions, especially Arequipa, but many others are very general and refer only incidentally to Peru. There is no subject index or annotation. (*Same item* as 2.10–156 in Oct. 1951 *Meteorological Abstracts*.) *Subject Headings:* **Mountain meteorology, Bibliographies, Peru.**

2K–251 551.585 551.582(84)

Prada, Roberto, **Climas de Bolivia.** [Climates of Bolivia.] Bolivia, Dirección General de Meteorología, **1946.** 52 p. 5 plates, numerous tables. **GB-MO**—After setting out various systems of classification of climates, author gives a scheme applicable to Bolivia, with illustrative tables of mean temperature and precipitation. These include a number of stations above 3000 m., the highest being Charana (4059 m.), extremely cold, humid with dry winter and spring. Distribution of 45 climatic types is shown on a chart. *Subject Headings:* **Mountain meteorology, Climatic classification, Bolivia.**

2K–252 551.582:551.578.46(494)

Roshardt, P. A., **Der Winter in der Innerschweiz.** [Winter in central Switzerland.] *Société des sciences naturelles, Lucerne, Bulletin,* 15, **1946.** 143 p. **GB-MO**—This study, made for geobotanic purposes, is based on personal observations of the author and data from official climatological stations. It is mostly concerned with snow, but the last chapter deals with temperature. *Subject Headings:* **Mountain meteorology, Snow, Switzerland.**

1947

2K–253 551.594.221:621.316.9

Berger, K., **Lightning research in Switzerland.** *Weather,* 2(8):231–238, Aug. **1947.** 4 figs., 3 plates. **DWB**—Describes observations on Monte San Salvatore near Lugano since 1942, using a recording outfit connected to a lightning rod. A cathode ray oscillograph was installed in 1945; oscillograms are reproduced and lightning strokes analyzed (about the same number are + and −); there is great variation in current, charge and duration. (*See also* 2K–247 above.) *Subject Headings:* **Mountain meteorology, Lightning, Switzerland.**

2K–254 551.582:551.585.7(515)(235)

Flohn, Hermann, **Zum Klima der Hochgebirge Zentralasiens.** [On the climate of the high mountains of Central Asia.] *Meteorologische Rundschau,* 1(3–4):95–97, **1947. MH-BH**—Gives climatic data for Tian-Shanskaia (41°55′N., 78°14′E., 3605 m.), Omei-Shan (29°28′N., 103°41′E., 3092 m.) and Lhasa (29°48′N., 91°2′E., 3730 m.) from short series of observations. *Subject Headings:* **Mountain meteorology, Expeditionary climatic data, Central Asia, Tibet.**

2K–255 551.506.5:551.585.7(236)

Hunt, T. L., **Weather conditions on Kilimanjaro. An ascent of the western slopes.** *Weather,* 2(11):338–344, Nov. **1947.** 4 photos, fig., table. **DWB**—An account of an expedition Jan. 31–Feb. 5, 1947, describing cloud developments, katabatic winds, frost, etc. with a table of observations of temperature and humidity, 4870–15,320 ft. *Subject Headings:* **Mountain meteorology, Expeditionary climatic data, Kilimanjaro, Tanganyika.**

2K–256 551.501.9:551.43(788)

Lorant, M., **The highest laboratory.** *Meteorological Magazine,* London, 76:115, **1947.** 2 plates. **DWB**—A brief description with photos of the laboratory erected by the Massachusetts Institute of Technology and University of Denver at 14,260 ft. on Mt. Evans, mainly for the study of cosmic rays. Meteorological observations are also made. *Subject Headings:* **Mountain meteorology, Cosmic rays, Mountain observatories, Mount Evans, Colorado.**

2K–257 551.577.2(51)

Lu, Alfred, **Precipitation in the south Chinese-Tibetan borderland.** *Geographical Review,* 37:88–93, **1947.** 2 figs. **DLC**—Includes map of annual precipitation, 28–32°N., 102–105°E., discussion of orographic effect (increase from 1060 mm. at 352 m. to 1860 mm. at 3097 m.) and note on frontal activity. *Subject Headings:* **Mountain meteorology, Precipitation, Tibet.**

2K–258 551.506.2 551.576.2(234.3)

Prohaska, Fritz, **Die Bewölkungsverhältnisse auf dem Jungfraujoch während des internationalen Polarjahres 1932–1933 unter besonderer Berücksichtigung der Wolkengattungen.** [The cloud conditions on the Jungfraujoch during the international Polar Year 1932 1933 with special regard to cloud types.] *Naturforschende Gesellschaft, Vierteljahrsschrift,* Zurich, 92:117–136, **1947.** 5 figs., 7 tables, 3 refs. **DLC**—Tables and diagrams show: monthly means of cloud amount on Jungfraujoch, Rigi, Säntis and Sonnblick, Aug. 1932 through Aug. 1933, and for Jungfraujoch seasonal frequencies of different amounts, monthly frequencies of C_H, C_M, C_L and fog, and of occurrence and amount of sky cover and diurnal variation of different cloud types. The annual variation, typical of Alpine peaks, is largely governed by the variation of fog and high clouds. Medium clouds are comparatively rare. *Subject Headings:* **Mountain meteorology, Clouds, Jungfraujoch, Switzerland.**

1948

2K–259 551.585.7 551.55:551.524.7(234.3)

Ekhart, E., **De la structure thermique de l'atmosphère dans la montagne.** [On the thermal structure of the atmosphere in the mountains.] *La Météorologie*, **1948.** p. 3–26. 13 figs., photo, 15 refs. **DWB**—From a study of the horizontal and vertical distribution of temperature and pressure in the Alps, including upper air ascents, author develops the idea that a mountain system forms its own "atmosphere," extending some way above and around the system and separated from the free air by discontinuities. Within this are the distinctive atmospheres of valleys and slopes. *Subject Headings:* **Mountain meteorology, Pressure, Temperature, Alps.**

2K–260 551.582:551.585.7(481)

Spinnangr, F. and Eide, O., **On the climate of the lofty mountain region of southern Norway.** *Meteorologiske Annaler*, 2(13):403–464, **1948.** 66 tables, 6 refs. **DLC**—Gives climatic characteristics of 13 high-level stations. *Subject Headings:* **Mountain meteorology, Norway.**

2K–261 551.524.4:551.578.46(436)

Steinhauser, Ferdinand, **Die Schneehöhen in den Ostalpen und die Bedeutung der winterlichen Temperaturinversion.** [The snow depths in the eastern Alps and the importance of the winter temperature inversion.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 1:63–74, **1948.** 2 figs., 3 tables, 16 refs. German, English and French summaries p. 63–64. **MH-BH**—Mean maximum depth of snow increases by ca. 10 cm. per 100 m. height up to 1,000 or 1,100 m. above sea level. At this height, except on eastern slopes, there is a sharp decrease of depth, above which increase begins again at an increasing rate. This is associated with a marked winter inversion and decrease of fog at 1,000 to 1,100 m. (*Same abstract* as No. 4–117 in April 1950 *Meteorological Abstracts.*) *Subject Headings:* **Mountain meteorology, Snow cover, Temperature inversions, Austrian Alps.**

2K–262 551.521.1(43)

*Sydow, Erich, **Die Globalstrahlung in Oberstdorf und auf dem Nebelhorn.** [Global radiation in Oberstdorf and on the Nebelhorn.] *Meteorologische Rundschau*, 1(11–12):336–339, May–June **1948.** fig., 2 tables, 4 refs. German and English summaries p. 336. **DWB**—Data on total incoming radiation obtained at the two stations mentioned in item 2–102 in Feb. 1950 *Meteorological Abstracts* are analyzed to show variations with time of day and year, on clear and cloudy days, and between mountains and valleys. Five-day means are computed for the entire year to show how air mass movements affect the radiation climate of the northern slope of the Alps. (*Same abstract* as No. 2–101 in February 1950, *Meteorological Abstracts.*) *Subject Headings:* **Mountain meteorology, Solar radiation, Germany.**

1949

2K–263 551.508:551.585.7

Küttner, Joachim, **Messprobleme auf Bergstationen.** [Problems of measurement at mountain stations.] *Meteorologische Rundschau*, 2(1–2):37–41, Jan.–Feb. **1949.** 4 figs., 3 refs. **MH-BH**—The difficulties in measuring temperature and humidity are: ventilation, neighborhood of buildings, radiation, differences between windward and leeward sides, eddy clouds, icing of thermographs and drift snow; electrically aspirated thermographs are best. Rainfall measurement suffers from vertical currents, rime and drift snow. Anemometers are disturbed by adherence of snow, inclined winds and leeside whirls; a funnel free to move in three dimensions is recommended (Pendel-Prandtl-Rohr). Existing instruments are insufficiently protected. Barometers are almost useless in storms (errors exceed 4 mm.) Help is required from instrument makers. Comments on this article are made by E. REICHEL: "On the question of measurements at summit stations." *Ibid.*, p. 41–42. (*Same abstract* as No. 2–26 in February 1950 *Meteorological Abstracts.*) *Subject Headings:* **Observation techniques, Mountain meteorology.**

1950

2K–264 551.576:551.574.7:551.506

***§Contributions to the theory of the constitution of clouds.** *Mount Washington Observatory Research Report, Final Report*, July 31, **1950.** 44 p. figs., tables, refs., equations. (U. S. Air Force Cambridge Research Laboratories, Contract No. AF 28 (099)-25.) **DWB, MH-BH**—A comprehensive summary of studies made on the theory of cloud constitution and meteorological factors affecting icing. The latter section discusses the liquid water content of clouds as related to three basic cyclone types and to cold fronts, and the mean effective drop diameter as related to cyclone position and type, and to trajectory of surface air masses. Then a method is developed for correcting temperature at summit of Mt. Washington for cooling due to forced ascent of air over the

mountain. Finally, the drop size distribution in fog is subject to critical statistical tests, to determine best method of presentation of data. *Subject Headings:* **Cloud physics, Icing conditions, Synoptic studies, Mount Washington, New Hampshire.**—*M.R.*

2K–265 551.585.7(234.3)

Ekhart, E., **La classification des Alpes au point de vue météorologique.** [The classification of the Alps from the meteorological point of view.] *Geofisica Pura e Applicata*, **17**(3–4):136–141, **1950.** table, 12 refs. German and English summaries. **MH-BH**—Author classifies the Alps into: (1) slope atmosphere a few hectometers thick; (2) valley atmosphere; (3) mountain atmosphere over the mountain massifs and influenced by them either thermally or dynamically; (4) free atmosphere. Longitudinally the Alps are divided into central, north and south border, and north and south foothills. The characteristics of each are set out. (*Same item* as No. 2.5–179 in May 1950 *Meteorological Abstracts.*) *Subject Headings:* **Mountain meteorology, Climatic classification, Alps.**

2K–266 551.576(234.3)

Ekhart, E., **Zur Bewölkungsklimatologie der Alpen.** [On the cloud climatology of the Alps.] *Geografiska Annaler*, **32**(1–2):21–36, **1950.** figs., 6 charts, table, 10 refs. **DLC**—A detailed study illustrated by charts of mean annual cloudiness, cloud-rainfall index (mean cloudiness/number of days of precipitation), annual range of cloudiness, distribution of principal types of annual variation, and vectors of harmonic components of annual and semiannual variation. The apparent vertical variation of mean annual cloudiness shows a minimum (45%) at sea level and a maximum (65%) above 3000 m., with a secondary maximum (58) below 500 m. and a secondary minimum (52) at 1500 m. *Subject Headings:* **Mountain meteorology, Clouds, Alps.**

SUPPLEMENTARY MATERIAL

2K–267 551.586:612.275

Bert, Paul, **Barometric pressure; researches in experimental physiology.** Columbus, Ohio, College Book Co., **1943.** 1055 p. port., diagrs., graphs, tables, refs. Trans. by Mary Alice Hitchcock and Fred A. Hitchcock from the original French entitled: **La pression barométrique. Recherches de physiologie expérimentale.** Paris, G. Masson, **1878.** 1168 p. **DLC**—An old but classical and very comprehensive work on all phases of high altitude physiology. Experiments were made with plants, animals and human beings in balloons, on mountains, and in the laboratory with reduced pressure. By keeping absolute pressure constant and reducing oxygen pressure, Bert proved "beyond doubt" that mountain sickness is due to decreased oxygen, not decreased atmospheric pressure. High altitude effects are discussed in great detail by regions (continents), mountain systems, and by subject, including expeditions, balloon ascents and upper limits of habitation or human activity. *Subject Headings:* **Mountain meteorology, Pressure effects, Physiology, High altitude habitations.**—*M.R.*

See Nos. 2.1–112, 2.1–151, 2.3–94, 2.3–144, 2.4–11, 2.5–3, 2.5–15, 2.5–60, 2.5–87, 2.5–96, 2.5–106, 2.5–112, 2.5–116, 2.5–145, 2.5–154, 2.5–179, 2.5–180, 2.5–197, 2.6–95, 2.6–141, 2F–55, 2.7–26, 2.8–46, 2.8–84, 2.8–108, 2.8–109, 2.8–144, 2.8–156, 2 11–161, 2.11–176 in *Meteorological Abstracts* for material on Mountain Meteorology not included in this bibliography.

PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Note: The contents of periodicals included in this section are for information only, and will not be listed in the monthly indexes until abstracted. When material is furnished in advance of date of publication, the pagination may be omitted.

American Geophysical Union, Transactions, Volume 32, Number 5, October 1951.

Herman, L. and Leinbach, H.: **A photographic study of changes of the infrared emission of the polar aurora,** p. 679–682.

Palmer, C. E.: **On high-level cyclones originating in the tropics,** p. 683–696.

Hitschfeld, Walter: **Free fall of drops through air,** p. 697–700.

Todd, David K.: **On summertime rainfall at New York, N. Y.,** p. 701–703.

Johnson, J. W., Fuchs, R. A. and Morrison, J. R.: **The damping action of submerged breakwaters,** p. 704–718.

Callaway, E. B.: **Graphical determination of specific-volume anomaly and current,** p. 719–728.

Wentworth, Chester K.: **The problem of safe yield in insular Ghyben-Herzberg system,** p. 739–742.

Kellogg, W. W.: **Report of the standing committee on problems of the upper atmosphere,** p. 755–759.

Byers, Horace R.: **Report of the committee on cloud physics—1951,** p. 760–764.

Thornthwaite, C. W., Church, Phil E. and Mather, John R.: **Report of the committee on climatology, 1950–1951,** p. 765–768.

Hastings, W. W.: **Report of committee on the chemistry of natural waters,** 1950–1951, p. 769.

Lohman, S. W. (Chairman) and others: **Report of the committee on ground water, 1949–1950,** p. 769–772.

McDonald, James E. and Blanchard, Duncan C.: **Discussion of "The Behavior of water drops at terminal velocity in air" by Duncan C. Blanchard,** p. 775–777.

Carr, John H. and Hamilton, W. S.: **Discussion of "Forces exerted by waves on a sloping board" by W. S. Hamilton,** p. 777–779.

Kashef, Abdel-Aziz I., Luthin, James N. and Gaskell, R. E.: **Discussion of "Numerical solutions for tile drainage of layered soils" by James N. Luthin and R. E. Gaskell,** p. 779–780.

Schiff, Leonard, Holtan, H. N. and Kirkpatrick, M. H., Jr.: **Discussion of "Rainfall, infiltration, and hydraulics of flow in runoff computation" by H. N. Holtan and M. H. Kirkpatrick, Jr.,** p. 780–782.

American Meteorological Society, Bulletin, Volume 32, Number 7, September 1951.

Little, D. M.: **The session of the World Meteorological Organization (WMO) in Paris, 1951,** p. 239–244.

Allen, Louis: **Navigating with the weather,** p. 245–250.

Holzman, B. G.: **Meteorological aspects of the atomic "Base Surge,"** p. 251–258.

Fergusson, Sterling P.: **Nephoscopes (1),** p. 259–266.

Program of the 113th National Meeting of the American Meteorological Society, October 9–10–11, 1951, at Minneapolis, Minnesota (Sponsored by the Minnesota Branch), p. 267–273.

Newson, E. Wendell: **The symposium on atmospheric turbulence in the boundary layer, Massachusetts Institute of Technology, 4–8 June 1951,** p. 273–274.

Annales de Géophysique, Volume 7, Number 2, April–June 1951.

Blamont, Jacques-Émile and Kastler, Alfred: **Réalisation d'un photomètre photoélectrique pour l'étude de l'émission crépusculaire de la raie D du sodium dans la haute atmosphère,** [Realization of a photoelectric photometer for the study of the crepuscular emission of D rays of sodium in the upper atmosphere], p. 73–89.

Dubois, Jean: **Contribution à l'étude de l'ombre de la terre. Première partie,** [Contribution to the study on the earth's shadow. Part one], p. 103–135.

Donitch, N.: **Formation de nuages mammatus observée le 26 mars 1948 à Temanrasset (Hoggar, Algérie Méridionale),** [Formation of mammatus clouds observed on March 26, 1948 in Tamanrasset (Ahaggar, Southern Algeria)], p. 136.

Annales de Géophysique, Volume 7, Number 3, July–September 1951.

Tcheng, Mao-lin: **Étude spectrophotométrique de la polarisation de la lumière de ciel bleu au zénith de 3050 à 4500 Å,** [Spectrophotometric study of the polarization of the light of the blue sky at the zenith from 3050 to 4500 Å], p. 137–144.

Dubois, Jean: **Contribution à l'étude de l'ombre de la terre. Deuxième partie,** [Contribution to the study on the earth's shadow. Part two], p. 145–168.

Annali di Geofisica, Volume 3, Number 4, October 1950.

Righini, G. and Godoli, G.: **Sui numeri caratteristici dell'attività solare,** [On the characteristic numbers of solar activity], p. 501–513.

Annali di Geofisica, Volume 4, Number 1, January 1951.

Penta, F. and Conforto, B.: **Sulle misure di temperatura del sottosuolo nei fori trivellati in presenza di acqua e sui relativi rilievi freatimetrici in regioni idrotermali,** [On the measurement of subsoil temperatures in fumaroles in the presence of water and its relative relief], p. 43–93.

Annali di Geofisica, Volume 4, Number 2, April 1951.

Aliverti, G. and Pannocchia, G.: **Risultati di un anno di misure eseguite a Pavia, a cielo sereno, con il dosimetro per l'ultravioletto,** [Results of a year of observations made at Pavia, during clear weather, with an ultraviolet dosimeter], p. 207–211.

Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A, Volume 4.

Rossby, C. C.: **Ueber die Vertikalverteilung von Windgeschwindigkeit und Schwerestabilität in Freistrahlbewegungen der oberen Troposphäre,** [On the vertical distribution of stability of wind velocity and density in free radiation motions of the upper troposphere], p. 3–23.

McIntyre, D. P.: **The philosophy of the Chicago School of Meteorology,** p. 24–32.

Van Mieghem, J.: **La turbulence isentropique latérale dans le tourbillon circulaire,** [The lateral isentropic turbulence in the circular vortex], p. 33–40.

Raethjen, P.: **Ueber den planetarischen Austausch der Vorticität und des Rotationsmoments,** [On the planetary exchange of vorticity and of the rotation force], p. 41–52.

Kleinschmidt, E.: **Grundlagen einer Theorie der tropischen Zyklonen,** [Fundamental theory of tropical cyclones], p. 53–72.

Haurwitz, B.: **The motion of binary tropical cyclones,** p. 73–86.

Schumann, T. E. W. and van Rooy, M. P.: **Frequency of fronts in the Northern Hemisphere,** p. 87–97.

Pollak, L. W. and Tedde, P. G.: **On the frequency of cyclones over the North Atlantic related to the sunspot cycle,** p. 98–111.

Wippermann, F.: **Zur Frage des Einflusses der Land- und Meerverteilung auf die Lage der quasistationären Tröge in einer atmosphärischen Zonalzirkulation,** [On the problem of the influence of land- and sea distribution on the position of quasi-stationary troughs in an atmospheric zonal circulation], p. 112–121.

Reuter, H.: **Zur numerischen Methode der Vorhersage von Aenderungen der 500mb-Fläche nach Charney und Eliassen,** [On the numerical method of forecasting the change of the 500 mb surface according to Charney and Eliassen], p. 122–127.

Hesselberg, Th.: **Mean transport in the atmosphere,** p. 128–141.

Möller, F. and de Bary, E.: **Der Wärme- und Wasserdampfhaushalt der freien Atmosphäre,** [The heat- and water vapor balance of the free atmosphere], p. 142–155.

Defant, F.: **Die Aenderungen des meridionalen Windprofils durch Kondensationswärme und Turbulenzvorgänge,** [Changes of meridional (sp.) wind profile through heat of condensation and turbulence processes], p. 156–175.

Scorer, R. S.: **Gravity waves in the atmosphere,** p. 176–193.

Schwerdtfeger, W.: **Hohe und komplexe Druckänderungen im Bereich der Anden,** [High and complex pressure-changes in the area of the Andes], p. 194–202.

Koschmieder, H.: **Zur Trombenbildung,** [On tornado formation], p. 203–219.

Bleeker, W. and Delver, A.: **Some new ideas on the formation of windspouts and tornadoes,** p. 220–237.

Hoinkes, H.: **Frontenanalyses mit Hilfe von Bergbeobachtungen. Ein Beitrag zur Frage des Voreilens der Kaltluft in der Höhe,** [Frontal analysis by means of mountain-observations. A contribution to the problem of the advance of cold air aloft], p. 238–268.

Cappel, A.: **Kritische Betrachtung einiger Weltkorrelationen,** [Critical consideration of some worldwide correlations], p. 263–271.

Baur, F.: **Zum Problem der Entstehung und Voraussage von Hochdrucklagen,** [On the problem of the origin and the forecasting of high pressure situations], p. 272–295.

Defant, A.: **Windstau und Auftrieb an ozeanischen Küsten,** [Wind "stau" and upslope motion on oceanic coasts], p. 296–308.

Weickmann, H. K.: **A theory of the formation of ice crystals,** p. 309–323.

Conrad, V.: **A method of estimating the periodic constituent of a geophysical series,** p. 324–337.

Lugeon, J. and Ackermann, P.: **Bestimmung der Temperaturfalschmessungen von Radiosondenaufstiegen infolge des Trainageeffektes,** [Determination of erroneous temperature measurements at radiosonde ascents due to lag], p. 338–342.

Fritz, S.: **Ozone measurements during sudden ionospheric disturbances,** p. 343–350.

O'Donnel, G. A. and Hess, V. F.: **A comparative study of atmospheric conductivity at ground level and at one meter above ground,** p. 351–367.

Chapman, S.: **The equatorial electrojet as detected from the abnormal electric current distribution above Huancayo, Peru, and elsewhere, p. 368–390.**

Burkard, O.: **Die halbjährige Periode der F_2-Schicht-Ionisation,** [The half year period of the F_2 ionization layer], p. 391–402.

Schneider, O.: **Vorschläge zur statistischen Erfassung erdmagnetischer Mikropulsationen,** [Suggestions for statistical determination of terrestrial magnetism pulsations], p. 403–412.

Caloi, P.: **Teoria delle onde de Rayleigh in mezzi elastici e firmoelastici, eposta con le omografie vettoriali,** [Theory of Rayleigh waves in elastic and semielastic media presented by means of homographic vectors], p. 413–435.

Wanner, E.: **Zur Statistik der Erdbebenschwärme,** [On the statistics of earthquake swarms], p. 436–448.

Australian Journal of Scientific Research, Series A, Physical Sciences, Volume 4, Number 2, June 1951.

Piddington, J. H. and Minnett, H. C.: **Solar radio-frequency emission from localized regions at very high temperatures,** p. 131–157.

Mills, B. Y. and Thomas, A. B.: **Observations of the source of radio-frequency radiation in the constellation of Cygnus,** p. 158–171.

Willis, J. B.: **The influence of slit-width on the shape and intensity of infra-red absorption bands,** p. 172–180.

Italy, Centro di Studi per la Geografia Fisica, II—Ricerche sulle Variazioni Storiche del Clima Italiano.

No. 1. Braun, G.: **Notizie meteorologiche e climatologiche della Venezia Giulia (Trieste, Istria e Friuli Orientale),** [Meteorological and climatological notes on Venezia Giulia (Trieste, Istria and Friuli Orientale)], 80 p., 1934.

No. 2. Mònterin, U.: **Il clima sulle Alpi ha mutato in epoca storica?** [Has the climate of the Alps changed during historic times?], 56 p., 1937.

No. 3. Visentini, M.: **Le variazioni del regime del Po, come indice di variazioni di clima,** [Variations of the Po regime as an index of climatic variations], 10 p., 1939.

No. 4. Mastrocinque, G.: **Notizie meteorologiche e climatologiche della Campania,** [Meteorological and climatological notes on Campanis], 178 p., 1938.

No. 5. Fabris, C.: **Contributi allo studio di variazioni della pressione atmosferica 1881–1930,** [Contributions to the study of atmospheric pressure variations from 1881–1930], 92 p., 1938.

No. 6. Capra, A.: **Variazioni periodiche della temperatura media a Bologna dal 1814 al 1933,** [Periodic variations of the mean temperature in Bologna from 1814 to 1933], 15 p., 1939

No. 7. Melicchia, A.: **Variazioni climatiche nella Pianura Padana e loro rapporti col regime del Po,** [Climatic variations of Padana Plain and their relationship to the Po regime], 142 p., 1939.

No. 8. Melicchia, A.: **Variazioni climatiche e variazioni interdiurne della pressione a Venezia (1881–1930),** [Climatic variations and interdiurnal variations of the pressure at Venice (1881–1930)], 27 p., 1940.

No. 9. Melicchia, A.: **Variazioni climatiche nell'Italia centrale e loro rapporto col regime del Tevere,** [Climatic variations on central Italy and their relationship to the Tevere regime], 200 p., 1942.

No. 10. Buli, U.: **Ricerche climatiche sulle Pinete di Ravenna,** [Climatic investigation on the Pinete di Ravenna], 77 p., 1949.

Meteorological Magazine, London, Volume 80, Number 952, October 1951.

Sawyer, J. S. and Ilett, B.: **The distribution of medium and high cloud near the jet streams,** p. 277.
Maidens, A. L.: **An automatic selecting device for "sferic" observations,** p. 281.
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Meteorological Magazine, London, Volume 80, Number 953, November 1951.

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Crossley, A. F.: **Meteorological examinations for civil pilots and navigators,** p. 318.
Dewar, D.: **Abrupt seasonal changes in tropopause level and stratosphere temperature at Habbaniya,** p. 323.
Absalom, H. W. L.: **General Assembly of the international Union of Geodesy and Geophysics, Brussels, 1951,** p. 326.
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Meteorology at the British Association, p. 333.

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Journal of Meteorological Research, Tokyo, Volume 2, Number 13, February 1951.

Saito, H.: **On the indoor climate,** p. 397–425.

Journal of Meteorological Research, Tokyo, Volume 2, Number 14, 15, March 1951.

Uwai, K.: **On the movement of rainfall-groups (II) (Analysis of the mechanism of heavy rainfall over the East Japan in the second decade of June, 1950),** p. 427–436, (15).
Uwai, K.: **On the movement of rainfall-groups (III) (Movement of rainfall-groups by the typhoon "Kitty"),** p. 437–445, (16).

Journal of Meteorological Research, Tokyo, Volume 3, Number 2, January 1951.

Ohta, S.: **Vapour pressure of a small solution particle (Studies on condensation nuclei, V.),** p. 45–50.
Kadowaki, T.: **On the wind "Yamase,"** p. 51–62.
Saito, N.: **Two cyclones with abnormal path,** p. 63–69.
Daigo, Y. and Suzuki, Y.: **On the climatic divisions concerning with the weather damages in Japan,** p. 70–77.

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Daigo, Y. and Suzuki, Y.: **Climatic division concerning with the yield of Aquatic rice, wheat, common barley and naked barley,** p. 79–98.
Daigo, Y. and Maruyama, E.: **On the distribution of air temperature in Oze-olain (1st report),** p. 99–105.
Daigo, Y. and Maruyama, E.: **Air temperature in observation field and in wheat field,** p. 106–108.

Journal of Meteorological Research, Tokyo, Volume 3, Number 5, March 1951.

Watanabe, T.: **Dynamical significance of the horizontal baroclinic field,** p. 139–144, (11).
Watanabe, T.: **A note on Charney-Eliassen's numerical prediction,** p. 145–150, (11).
Watanabe, T.: **Dynamical study of the eye of typhoon,** p. 151–156, (11).
Yoshino, I.: **On the heavy rainfall in Shikoku District accompanying the tropical storm of Aug. 1948,** p. 157–165, (12).

Journal of Meteorological Research, Tokyo, Volume 3, Number 6, March 1951.

Watanabe, M.: **Meteorological study on the Schoenobius Incertellus Wolker,** p. 167–173, (13).
Kobayashi, S.: **The fog in Seto Inland Sea,** p. 174–178, (13).
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Miyake, T.: **A simple mercury barometer with high magnification,** p. 230–233, (15).

Journal of Meteorological Research, Tokyo, Vol. 3, No. 7, May 1951.

Watanabe, T.: **Notes on the theory advection,** p. 235–241.
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Journal of Meteorological Research, Tokyo, Volume 3, Number 9, July 1951.

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